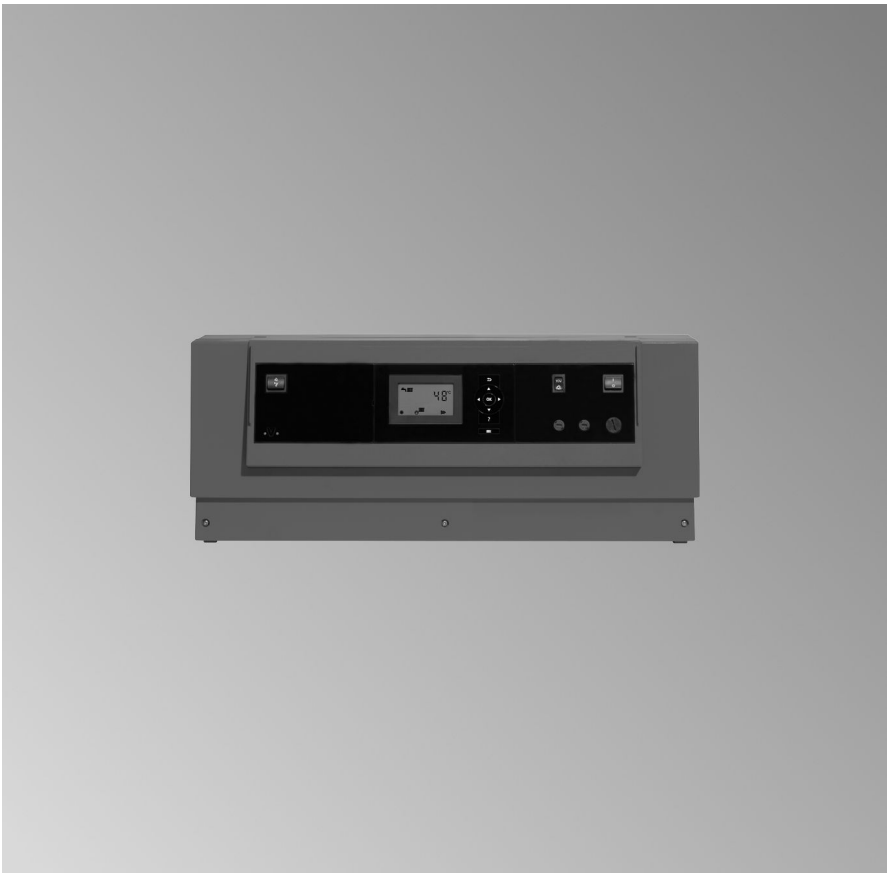
Installation and service instructions

for contractors

Vitotronic 100
Type GC1B
Digital boiler control unit

For applicability, see the last page

VITOTRONIC 100



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Please keep safe.

Safety instructions

Please follow these safety instructions closely to prevent accidents and material losses.

Safety instructions explained

Danger
This symbol warns against the risk of injury.

Please note
This symbol warns against the risk of material losses and environmental pollution.

Note
Details identified by the word "Note" contain additional information.

Target group

These instructions are exclusively designed for qualified personnel.
- Work on gas equipment must only be carried out by a qualified gas fitter.
- Work on electrical equipment must only be carried out by a qualified electrician.
- The system must be commissioned by the system installer or a qualified person authorised by the installer.

Regulations

Observe the following when working on this system
- all legal instructions regarding the prevention of accidents,
- all legal instructions regarding environmental protection,
- the Code of Practice of relevant trade associations,
- all current safety regulations as defined by DIN, EN, DVGW, TRGI, TRF, VDE and all locally applicable standards,
- Gas Safety (Installation & Use) Regulations
  - the appropriate Building Regulation either the Building regulations, the Building Regulation (Scotland), Building Regulations (Northern Ireland),
  - the Water Fittings Regulation or Water Bylaws in Scotland,
  - the current I.E.E. Wiring Regulations.

If you smell gas

Danger
Escaping gas can lead to explosions which may result in serious injury.
- Never smoke. Prevent naked flames and sparks. Never switch lights or electrical appliances ON or OFF.
- Close the gas shut-off valve.
- Open windows and doors.
- Remove all people from the danger zone.
- Notify your gas or electricity supplier from outside the building.
- Shut off the electricity supply to the building from a safe place (outside the building).

Safety instructions (cont.)

If you smell flue gas

Danger
Flue gas can lead to life-threatening poisoning.
- Shut down the heating system.
- Ventilate the boiler room.
- Close all doors leading to the living space.

Working on the system

- When using gas as fuel, also close the main gas shut-off valve and safeguard against unauthorised reopening.
- Isolate the system from the power supply and check that it is no longer 'live', e.g. by removing a separate fuse or by means of a main isolator.
- Safeguard the system against unauthorised reconnection.

Please note
Electronic modules can be damaged by electro-static discharges.
Touch earthed objects, such as heating or water pipes, to discharge static loads.

Repair work

Please note
Repairing components which fulfil a safety function can compromise the safe operation of your heating system.
Replace faulty components only with original Viessmann spare parts.

Ancillary components, spare and wearing parts

Please note
Spare and wearing parts which have not been tested together with the heating system can compromise its function. Installing non-authorised components and non-approved modifications/conversion can compromise safety and may invalidate our warranty. For replacements, use only original spare parts from Viessmann or those which are approved by Viessmann.

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Product information

This document describes Vitotronic 100 when used:
- in a single boiler system
- in a multi boiler system with higher third party control unit

These instructions are **not** required for multi boiler systems with the Vitotronic 300-K.

Overview of system examples

	Boiler	Characteristics	Page
Single boiler systems			
1	Vitoplex, Vitorond	Therm-Control	9
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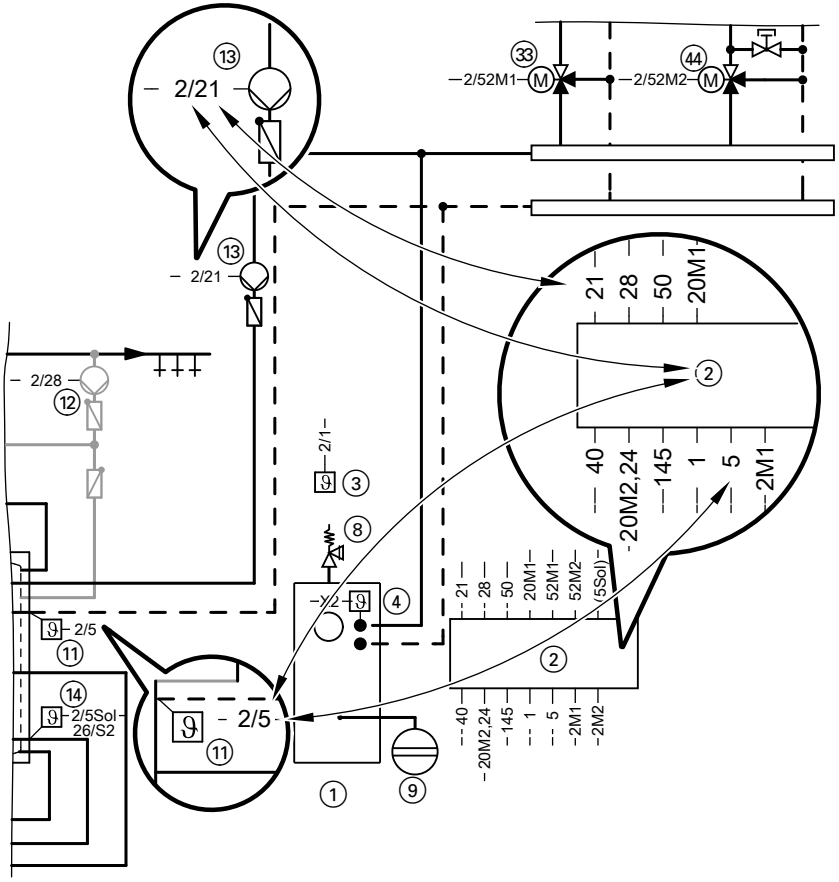
- These system examples are merely recommendations and must therefore be checked on site for completeness and function.
- The heating circuits must be regulated by an external control unit.
- Connect three-phase consumers via additional contactors.
- For multi boiler systems, the cascade and cylinder temperature must be controlled by a higher third party control unit.
- For multi boiler systems, the codes must be set on **every** Vitotronic 100.

Overview of system examples (cont.)

- For connecting a single boiler system to a higher third party control unit, see page 78.
- For connecting a multi boiler system to a higher third party control unit, see page 84.

Designations in the system schemes



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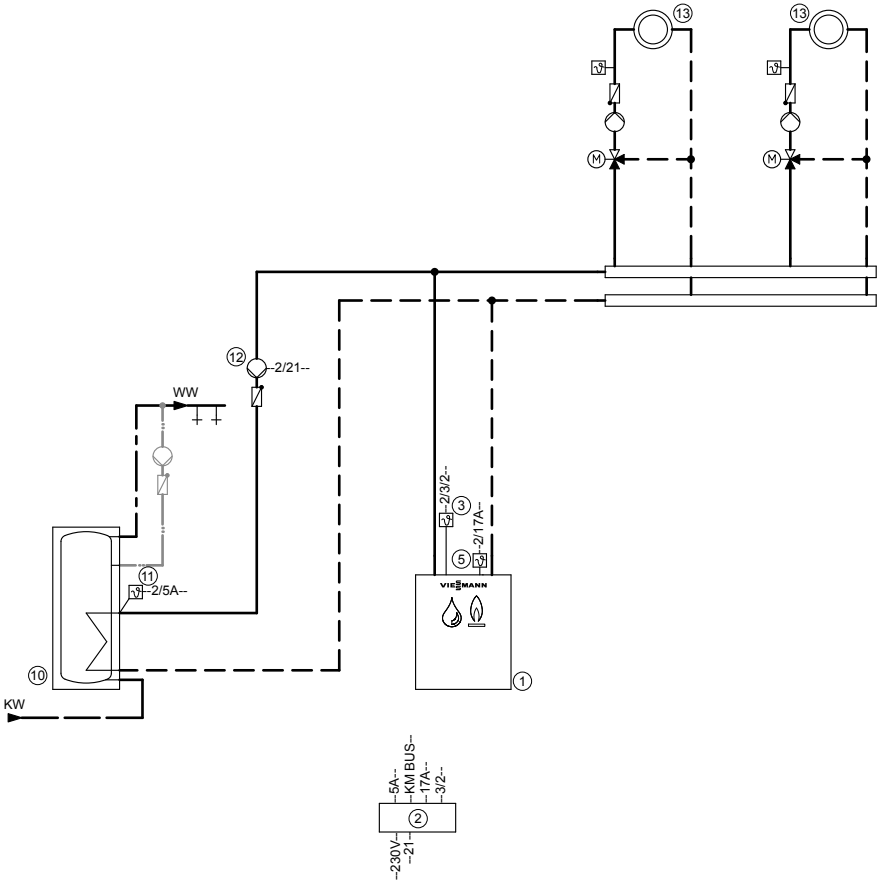
System example 1, ID: 4605419

Single boiler system: Boiler with Therm-Control

Hydraulic installation scheme



System example 1, ID: 4605419 (cont.)

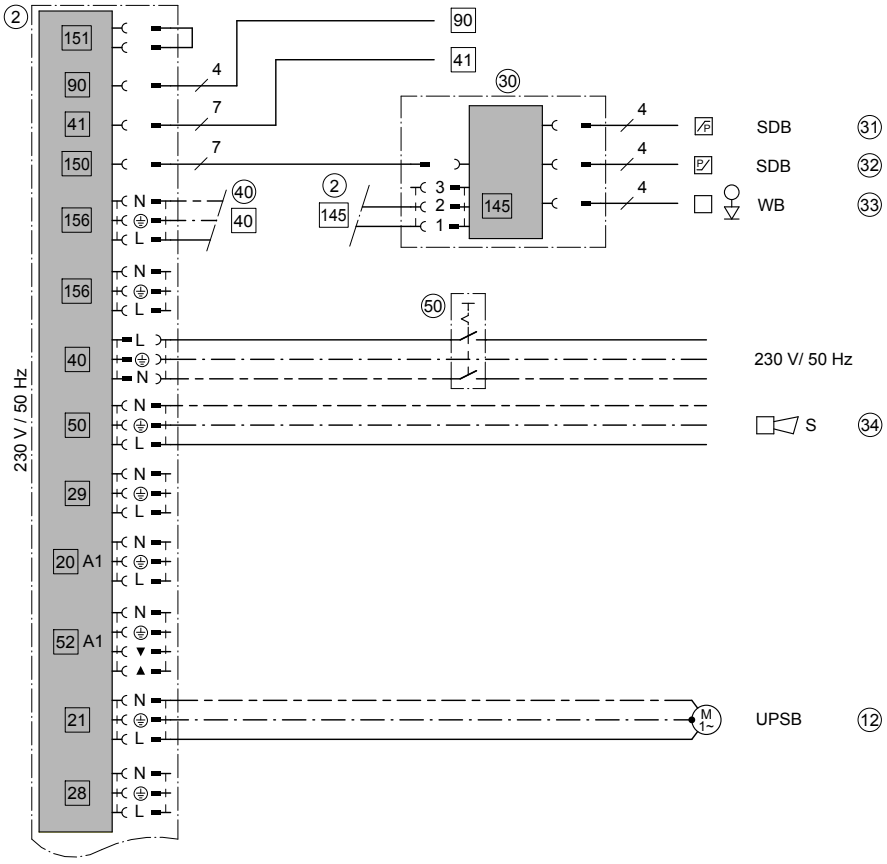
Equipment required

Pos.	Designation
①	**Boiler**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
⑤	Therm-Control temperature sensor
⑳	ON/OFF switch
⑩	**DHW cylinder**
⑪	Cylinder temperature sensor STS
⑫	Circulation pump for cylinder heating UPSB
⑬	**Heating circuits**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
㉟	Flue gas temperature sensor AGS
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ External demand, load-dependent
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉘	Contactor relay
㉙	Downstream heating circuit controller, contact closed: Signal for mixer "Close"
㉞	Central fault message system S
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V): ■ Specification of the set boiler water temperature
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
㊸	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
㊽	Vitocom 100

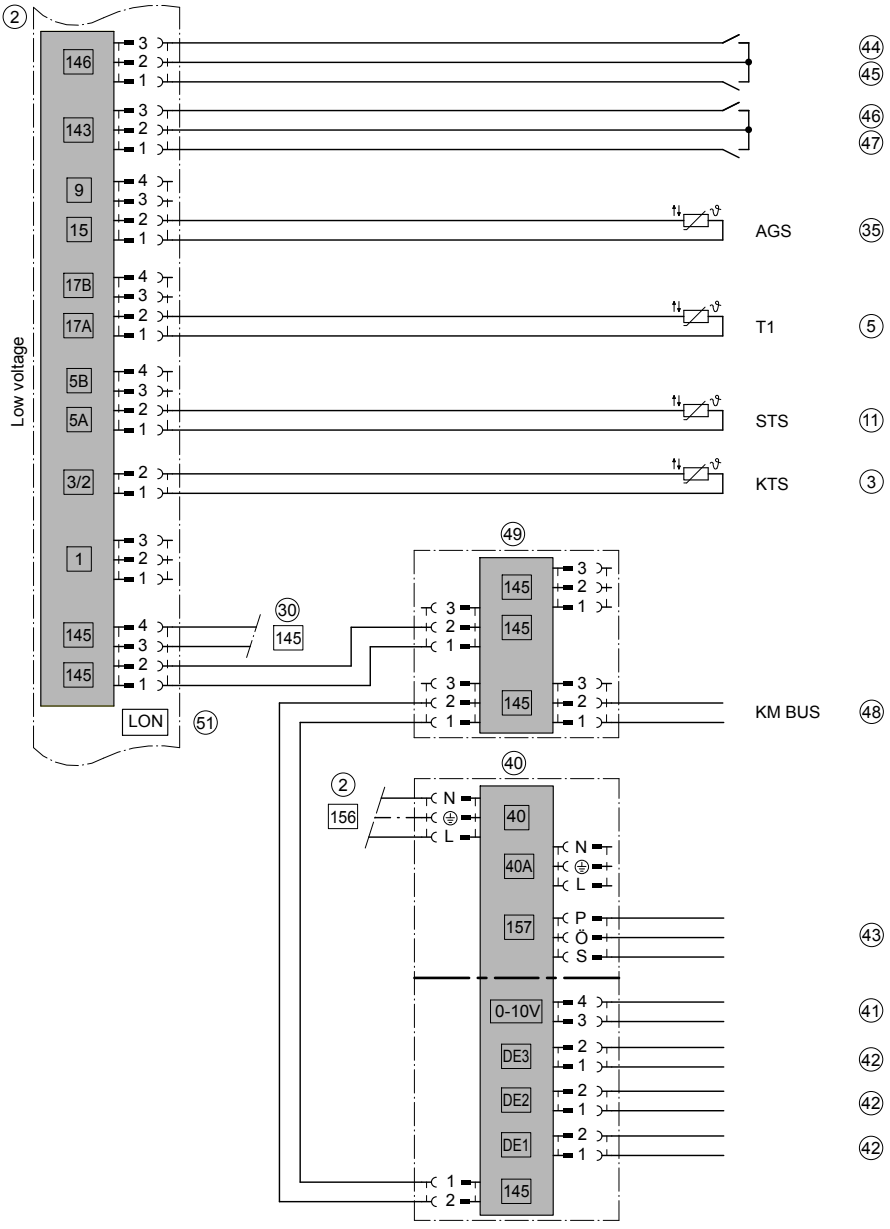
System example 1, ID: 4605419 (cont.)

Pos.	Designation
(49)	KM BUS distributor, for several KM BUS subscribers
(51)	LON communication module for communication with the following components: External control Vitocom 200 and 300 Vitogate 200, type EIB

Electrical installation scheme



System example 1, ID: 4605419 (cont.)



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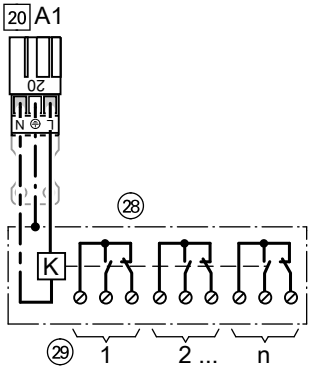
System example 1, ID: 4605419 (cont.)

Wiring diagram

Closing mixers installed downstream via Therm-Control temperature sensor in heating systems with heating circuit control units that are not connected to the boiler control unit via LON.



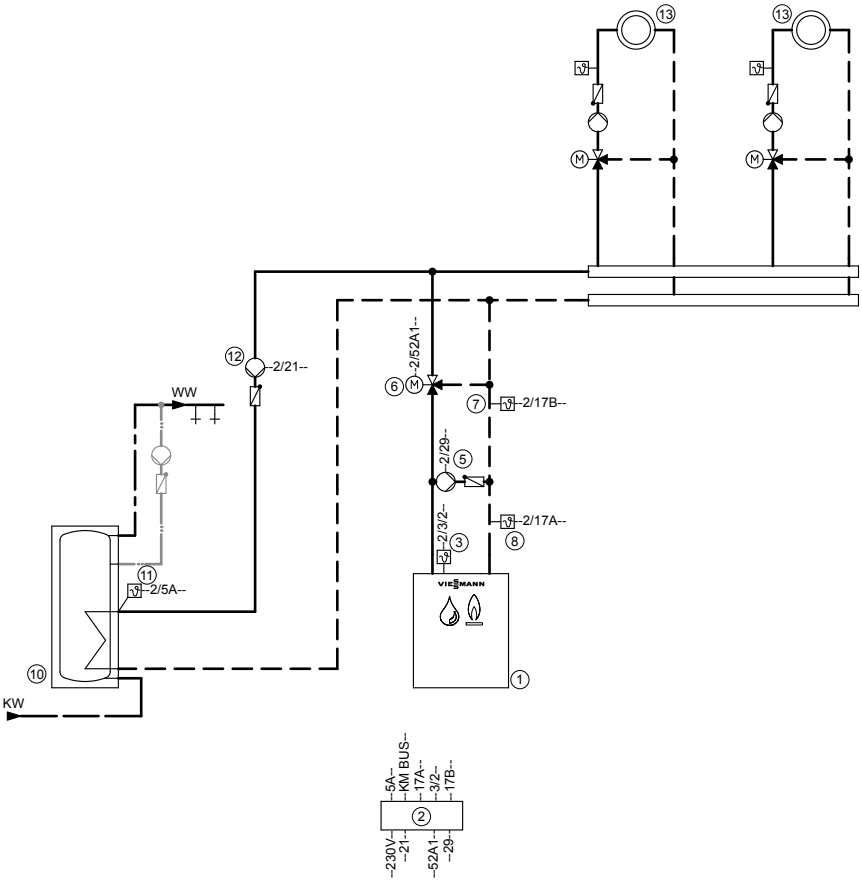
Required code

	Category	Function
0d:1	2 **"Boiler"**	Therm-Control temperature sensor affects the mixers of downstream heating circuits.
4C:2	1 **"General"**	Connection at plug 20 affects the mixers of downstream heating circuits.

System example 2, ID: 4605421

Single boiler system: Boiler with shunt pump and 3-way mixing valve for return temperature raising

Hydraulic installation scheme



System example 2, ID: 4605421 (cont.)

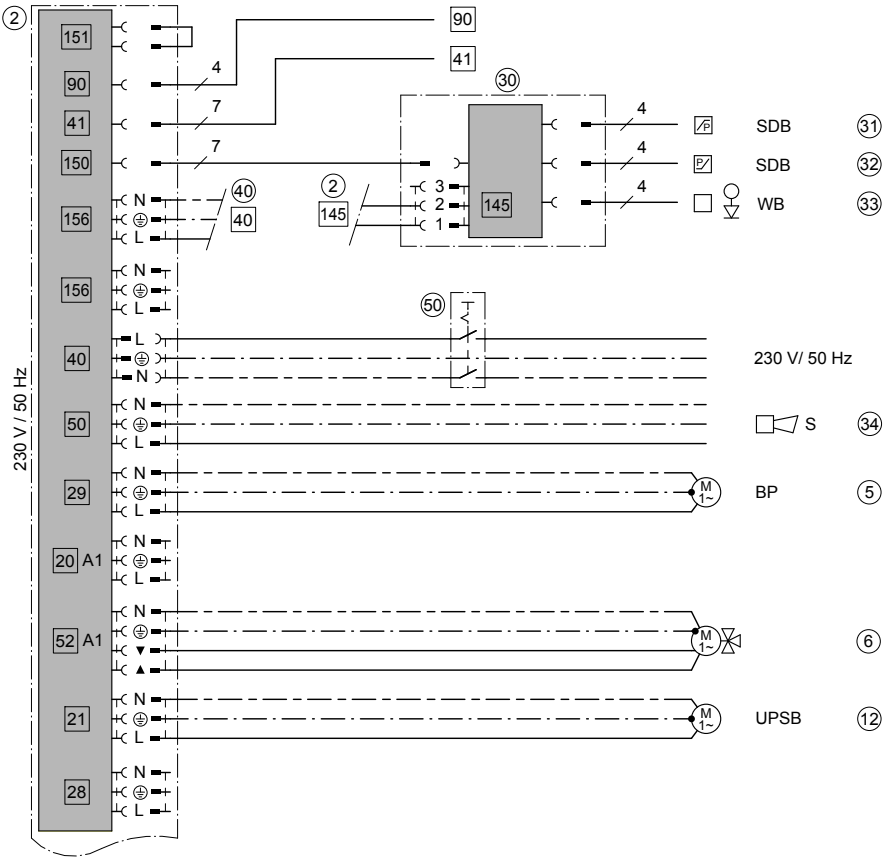
Equipment required

Pos.	Designation
①	**Boiler**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
⑤	Shunt pump (on site)
⑥	3-way mixing valve
⑦	Temperature sensor T2
⑧	Temperature sensor T1
⑤⓪	ON/OFF switch
⑩	**DHW cylinder**
⑪	Cylinder temperature sensor STS
⑫	Circulation pump for cylinder heating UPSB
⑬	**Heating circuits**
	Boiler accessories
③⓪	Plug-in adaptor for external safety equipment
③①	Minimum pressure limiter SDB
③②	Maximum pressure limiter SDB
③③	Water level limiter (low water indicator) WB
③⑤	Flue gas temperature sensor AGS
	External hook-ups (for connection to a higher third party control unit, see page 78):
④④	■ External demand, load-dependent
④⑤	■ External changeover of stepped/modulating burners
④⑥	■ External demand burner stage 2
④⑦	■ External demand burner stage 1
	System accessories
③④	Central fault message system S
④⓪	Extension EA 1
④①	1 analogue input (0 – 10 V): ■ Specification of the set boiler water temperature
④②	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
④③	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
④⑧	Vitocom 100

System example 2, ID: 4605421 (cont.)

Pos.	Designation
(49)	KM BUS distributor, for several KM BUS subscribers
(51)	LON communication module for communication with the following components: External control Vitocom 200 and 300 Vitogate 200, type EIB

Electrical installation scheme



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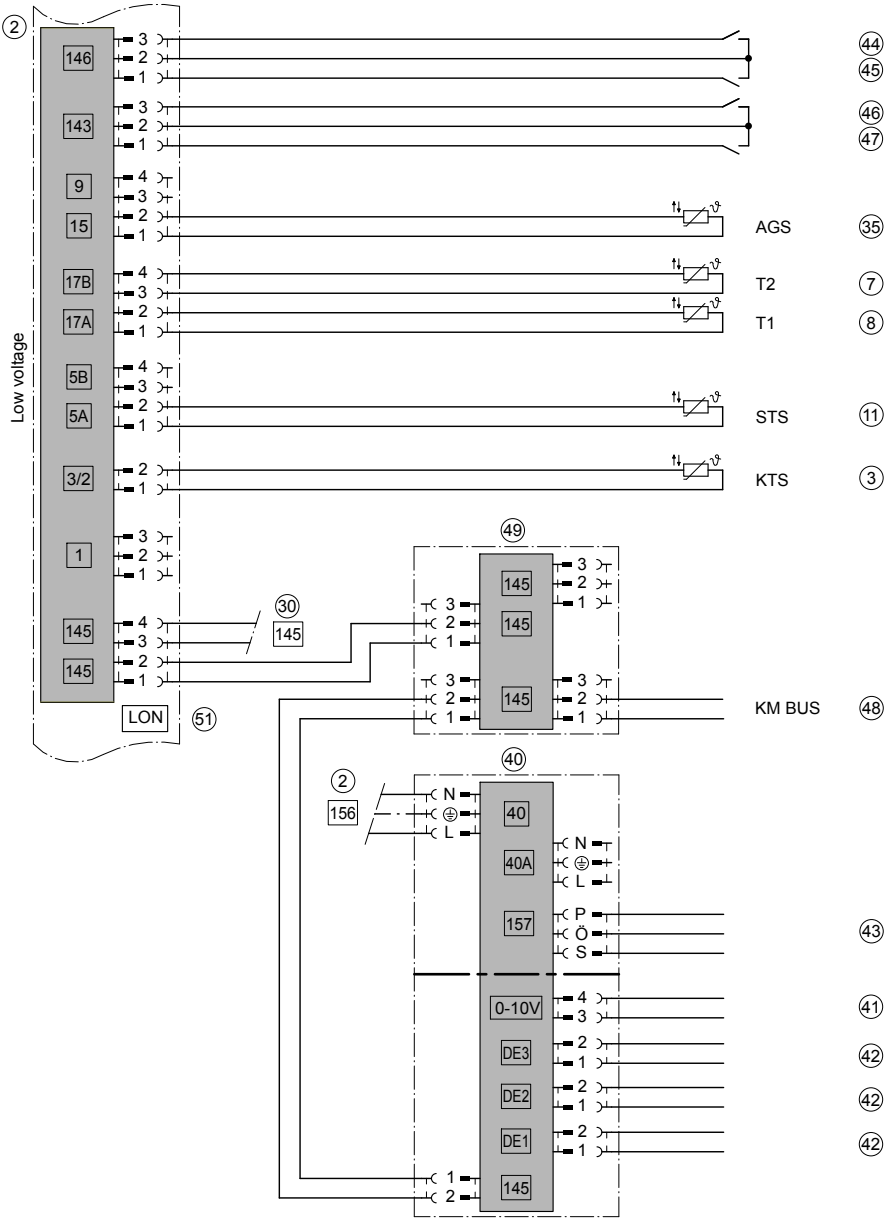
System example 2, ID: 4605421 (cont.)



System example 2, ID: 4605421 (cont.)

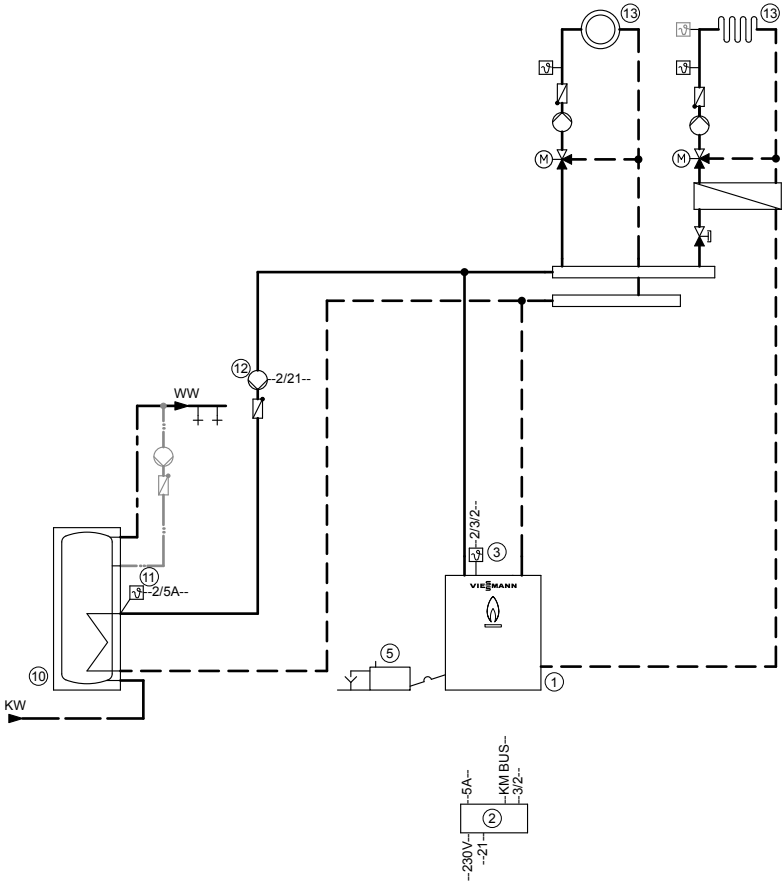
Required code

	Category	Function
0C:1	2 **"Boiler"**	Constant return temperature control.

System example 3, ID: 4605422

Single boiler system with Vitocrossal

Hydraulic installation scheme



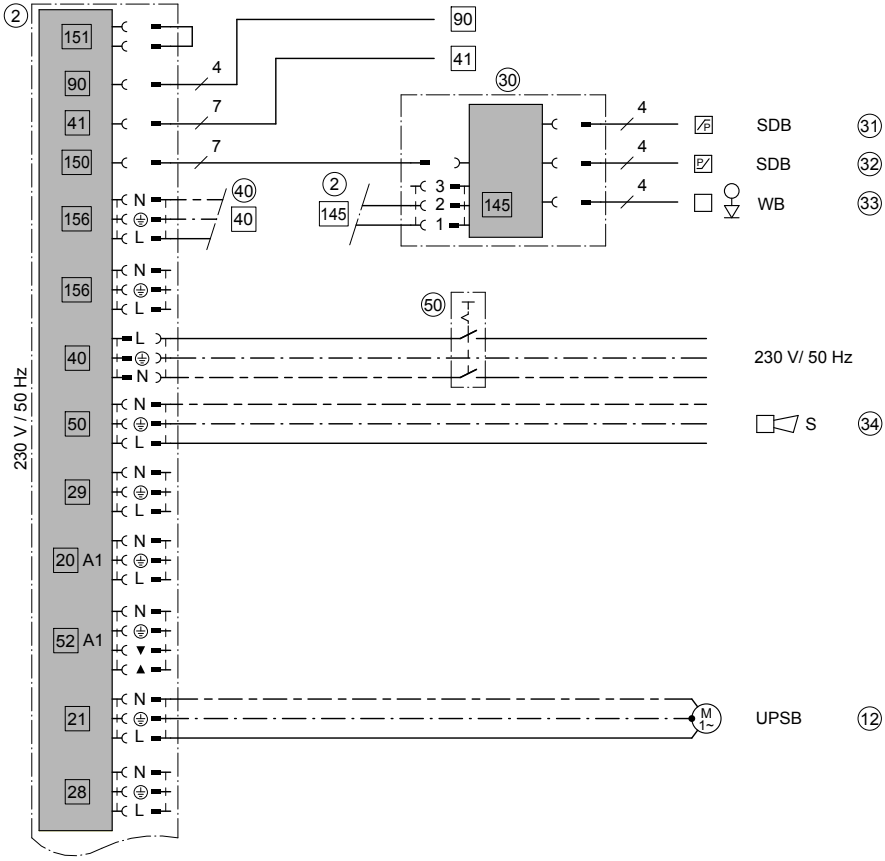
System example 3, ID: 4605422 (cont.)

Equipment required

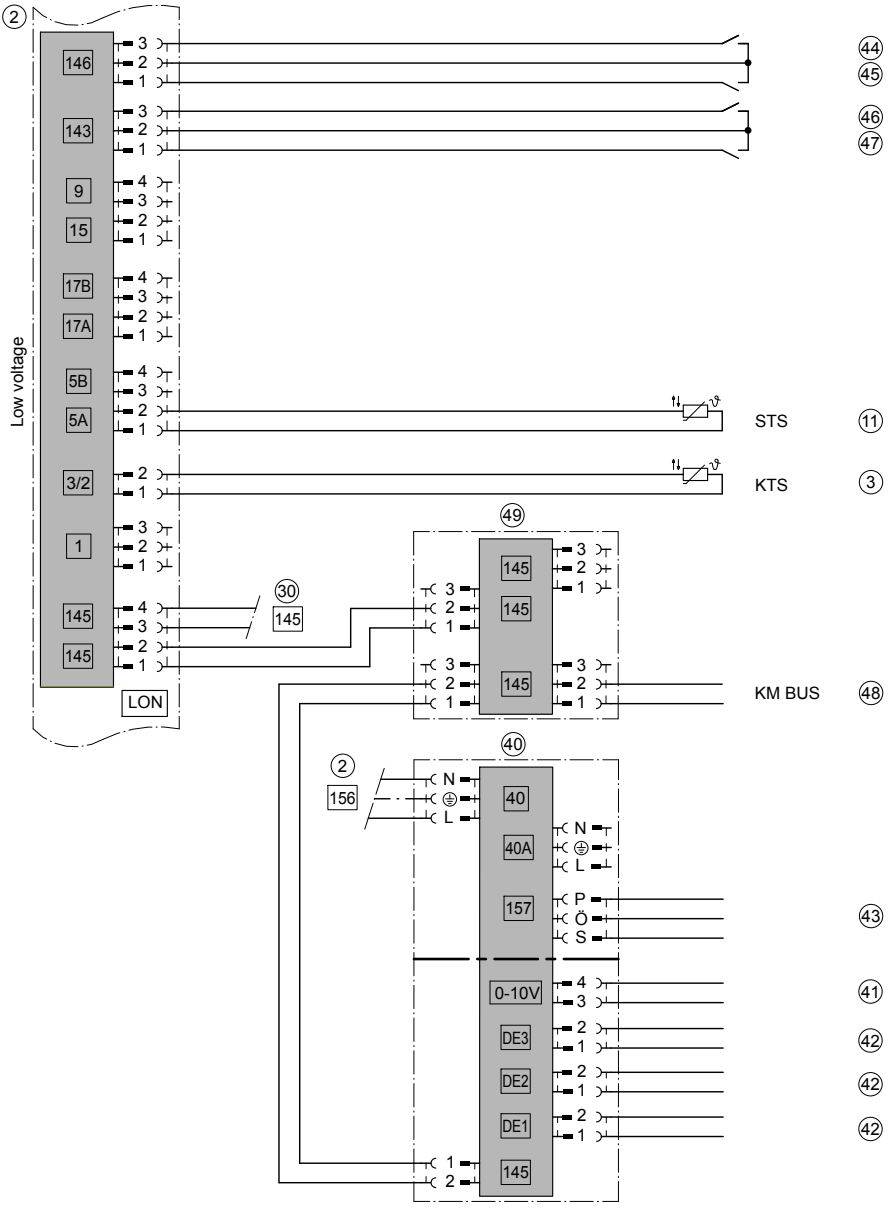
Pos.	Designation
①	**Boiler**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
⑤	Neutralising system
⑳	ON/OFF switch
⑩	**DHW cylinder**
⑪	Cylinder temperature sensor STS
⑫	Circulation pump for cylinder heating UPSB
⑬	**Heating circuits**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ External demand, load-dependent
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉞	Central fault message system S
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V): ■ Specification of the set boiler water temperature
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
㊸	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
㊽	Vitocom 100
㊾	KM BUS distributor, for several KM BUS subscribers
㊿	LON communication module for communication with external cascade control

System example 3, ID: 4605422 (cont.)

Electrical installation scheme



System example 3, ID: 4605422 (cont.)



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System example 3, ID: 4605422 (cont.)

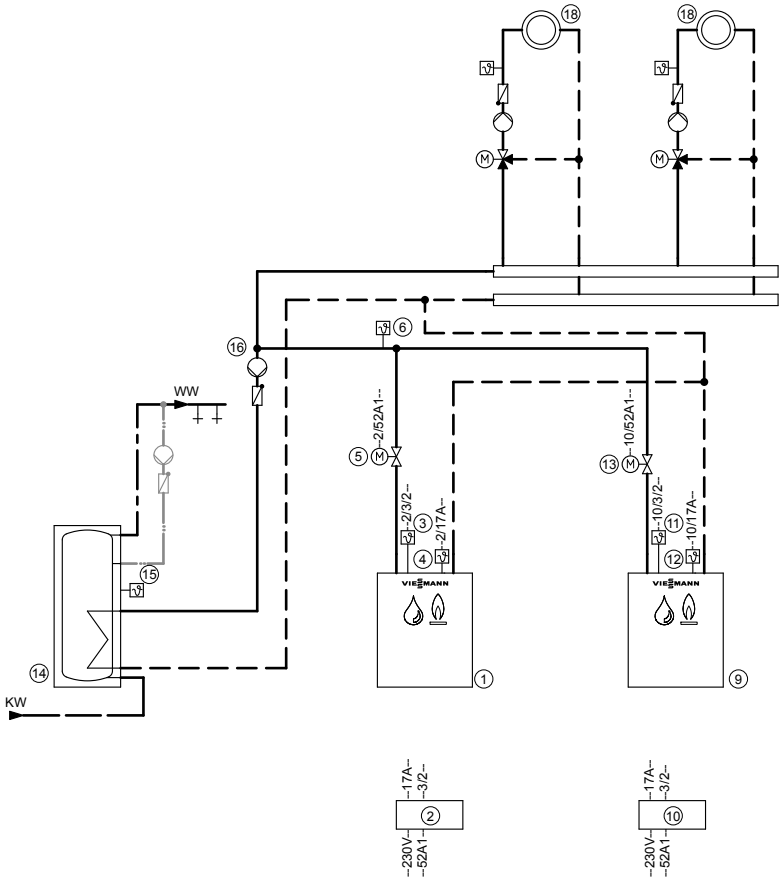
Required code

	Category	Function
0C:0	2 **"Boiler"**	Without Therm-Control temperature sensor.

System example 4, ID: 4605423

Multi boiler system: Boiler with Therm-Control

Hydraulic installation scheme



System example 4, ID: 4605423 (cont.)

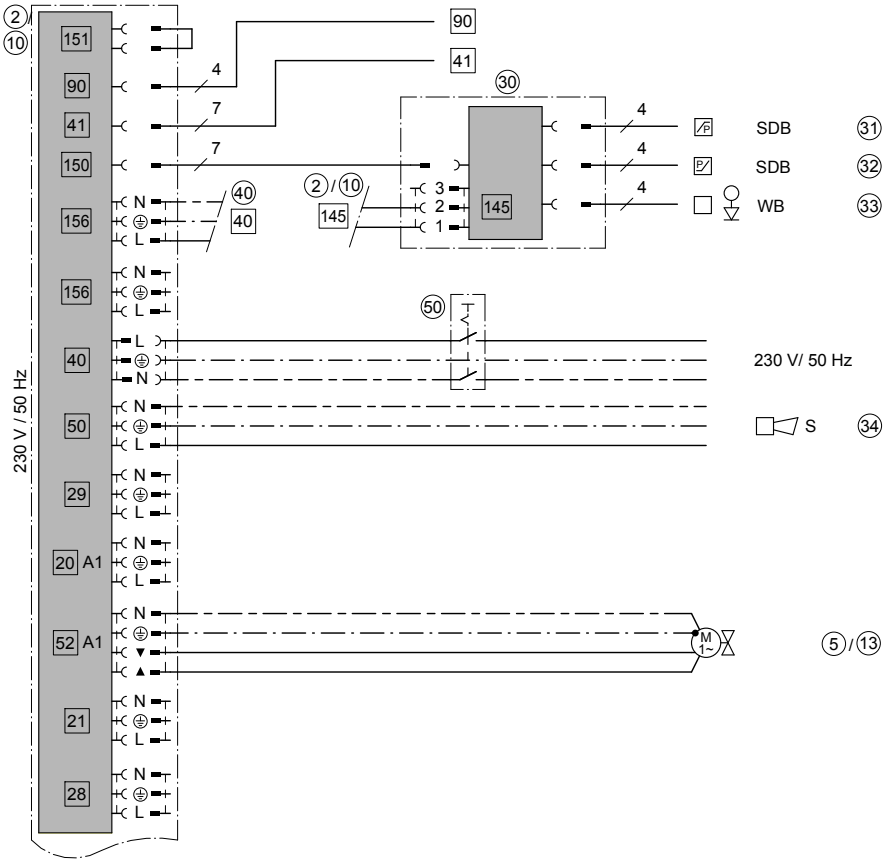
Equipment required

Pos.	Designation
①	**Boiler I**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
④	Therm-Control temperature sensor
⑤	Motorised butterfly valve
⑥	Flow temperature sensor (connection to higher third party control unit)
⑤⓪	ON/OFF switch
⑨	**Boiler II**
⑩	Vitotronic 100, type GC1B
⑪	Boiler water temperature sensor KTS
⑫	Therm-Control temperature sensor
⑬	Motorised butterfly valve
⑤⓪	ON/OFF switch
⑭	**DHW cylinder**
⑮	Cylinder temperature sensor (connection to higher third party control unit)
⑯	Circulation pump for cylinder heating (connection to higher third party control unit)
⑱	**Heating circuits**
	Boiler accessories
③⓪	Plug-in adaptor for external safety equipment
③①	Minimum pressure limiter SDB
③②	Maximum pressure limiter SDB
③③	Water level limiter (low water indicator) WB
③⑤	Flue gas temperature sensor AGS
	External hook-ups (for connection to a higher third party control unit, see page 78):
④④	■ Enable boiler, butterfly valve open/closed
④⑤	■ External changeover of stepped/modulating burners
④⑥	■ External demand burner stage 2
④⑦	■ External demand burner stage 1
	System accessories
③④	Central fault message system S
④⓪	Extension EA 1
④①	1 analogue input (0 – 10 V): ■ Default of the set boiler water temperature and enable boiler
④②	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input

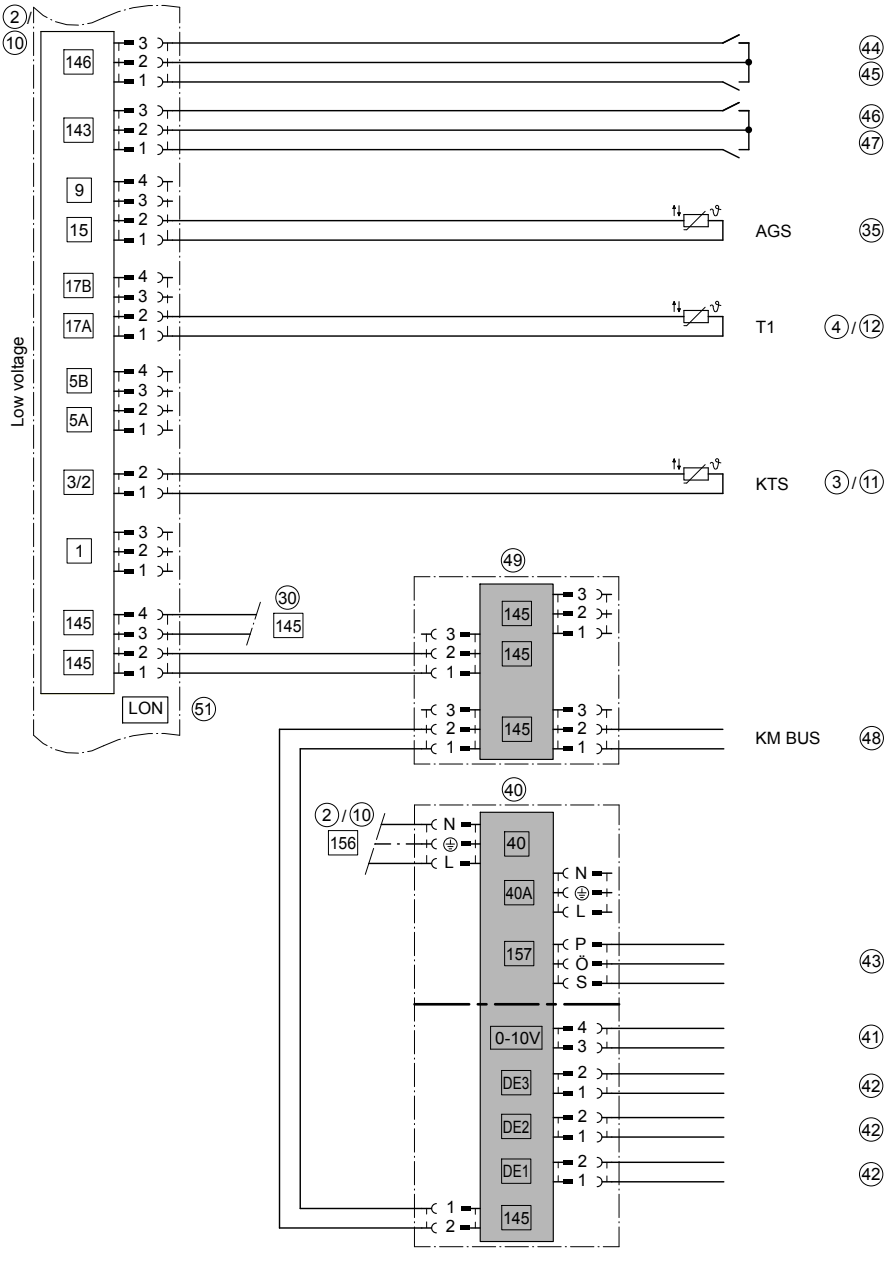
System example 4, ID: 4605423 (cont.)

Pos.	Designation
(43)	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
(48)	Vitocom 100
(49)	KM BUS distributor, for several KM BUS subscribers
(51)	LON communication module for communication with external cascade control

Electrical installation scheme



System example 4, ID: 4605423 (cont.)



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System example 4, ID: 4605423 (cont.)

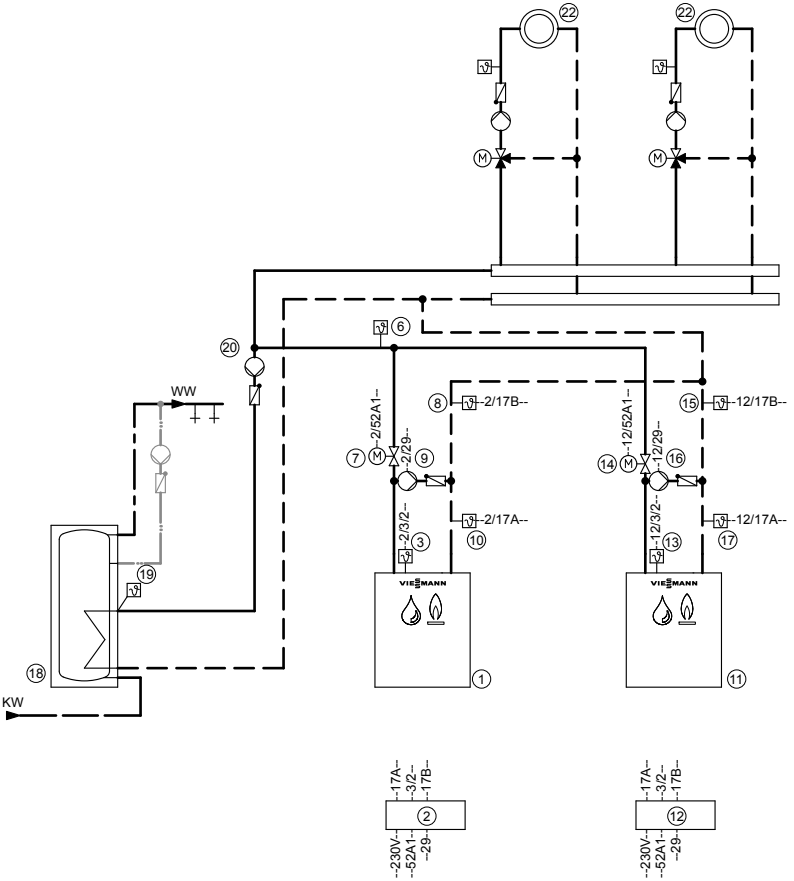
Required code

	Category	Function
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via LON.
01:3	2 **"Boiler"**	Multi boiler system with external cascade control via 0 – 10 V input or switching contacts.

System example 5, ID: 4605424

Multi boiler system: Any boiler with shunt pump for return temperature raising

Hydraulic installation scheme



System example 5, ID: 4605424 (cont.)

Equipment required

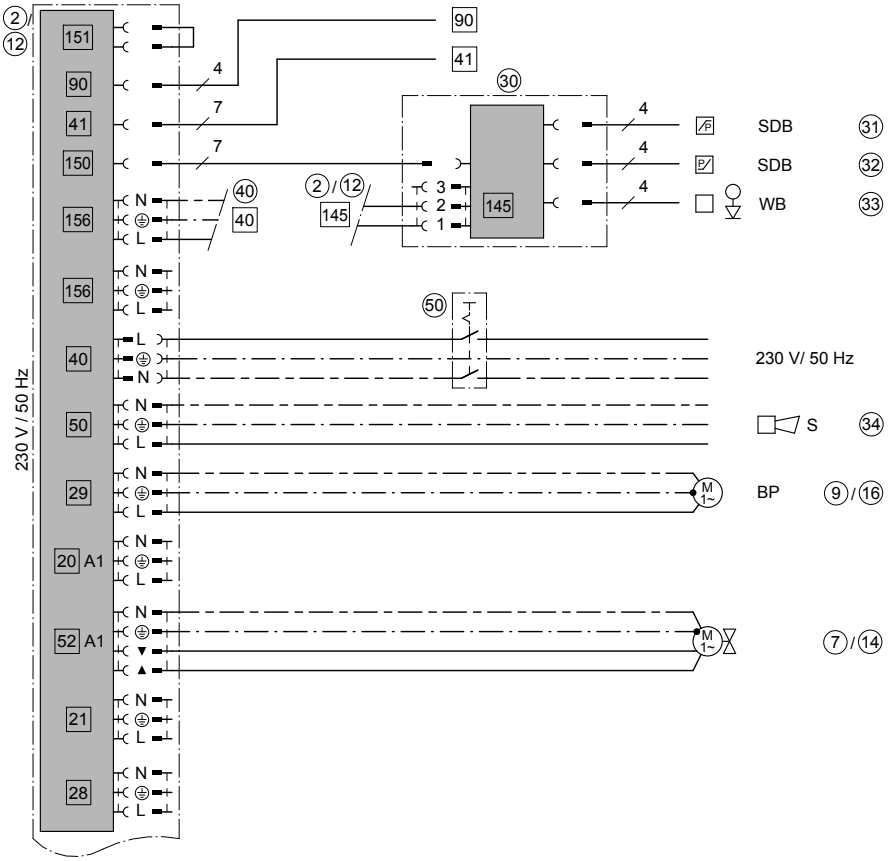
Pos.	Designation
①	**Boiler I**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
⑥	Flow temperature sensor (connection to higher third party control unit)
⑦	Motorised butterfly valve
⑧	Temperature sensor T2
⑨	Shunt pump (on site)
⑩	Temperature sensor T1
⑤⓪	ON/OFF switch
⑪	**Boiler II**
⑫	Vitotronic 100, type GC1B
⑬	Boiler water temperature sensor KTS
⑭	Motorised butterfly valve
⑮	Temperature sensor T2
⑯	Shunt pump (on site)
⑰	Temperature sensor T1
⑤⓪	ON/OFF switch
⑱	**DHW cylinder**
⑲	Cylinder temperature sensor (connection to higher third party control unit)
⑳	Circulation pump for cylinder heating (connection to higher third party control unit)
㉒	**Heating circuits**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
㉞	Central fault message system S
㉟	Flue gas temperature sensor AGS
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ Enable boiler, butterfly valve open/closed
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉞	Central fault message system S

System example 5, ID: 4605424 (cont.)

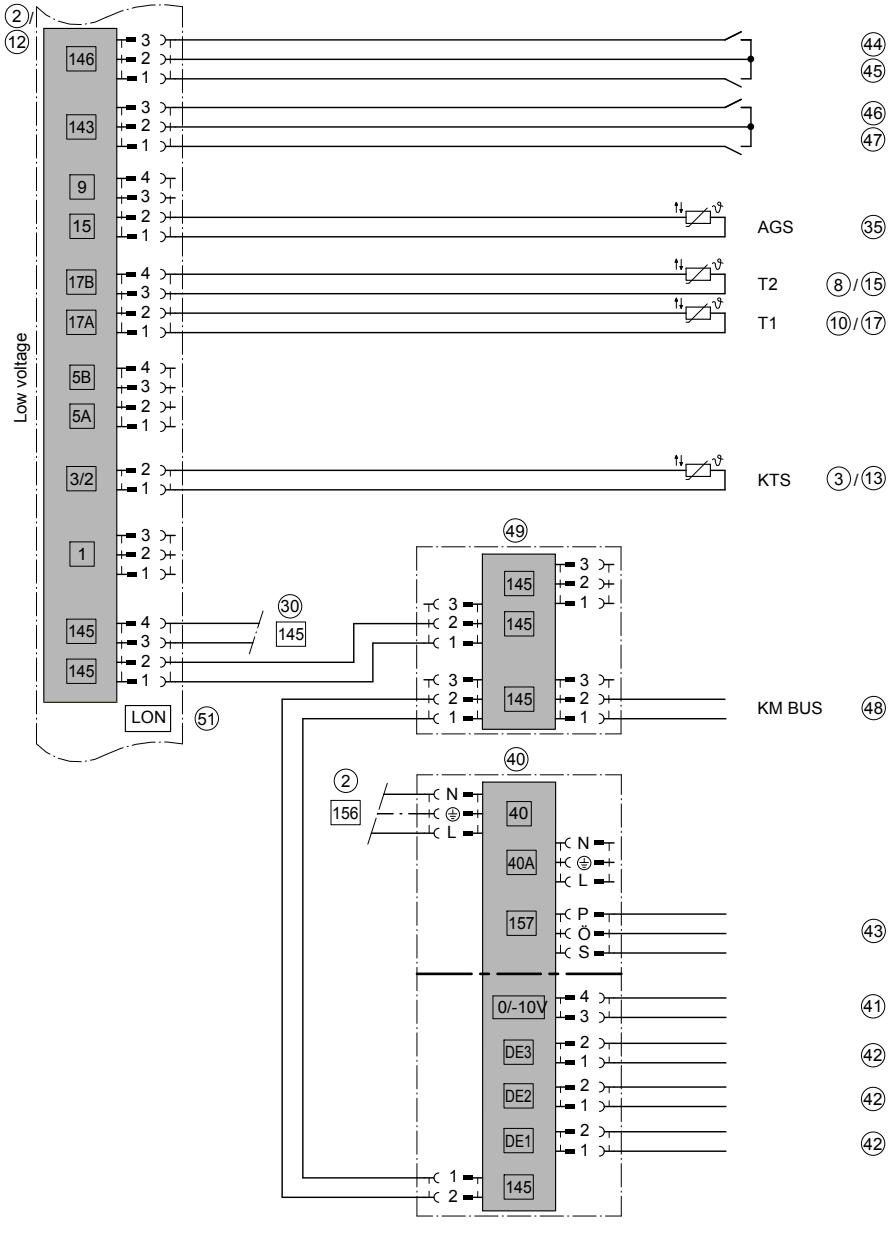
Pos.	Designation
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V): ■ Default of the set boiler water temperature and enable boiler
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
㊸	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
㊽	Vitocom 100
㊾	KM BUS distributor, for several KM BUS subscribers
㊿	LON communication module for communication with external cascade control

System example 5, ID: 4605424 (cont.)

Electrical installation scheme



System example 5, ID: 4605424 (cont.)



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System example 5, ID: 4605424 (cont.)

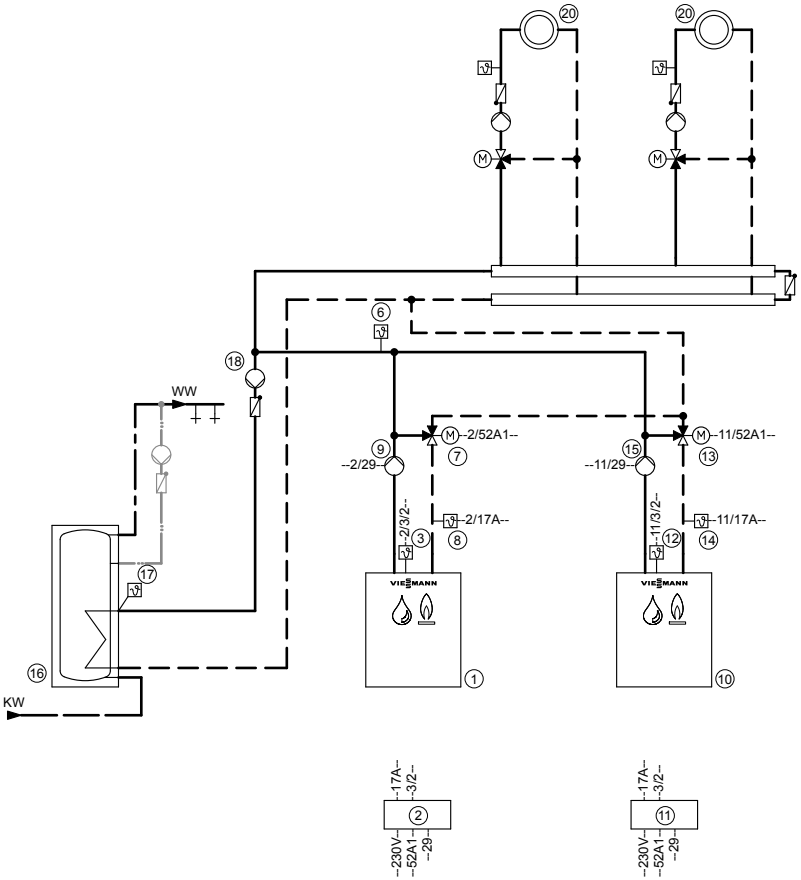
Required code

	Category	Function
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via LON.
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via 0 – 10 V input or switching contacts.

System example 6, ID: 4605428

Multi boiler system: Any boiler with boiler circuit pump and 3-way mixing valve for return temperature raising

Hydraulic installation scheme



System example 6, ID: 4605428 (cont.)

Equipment required

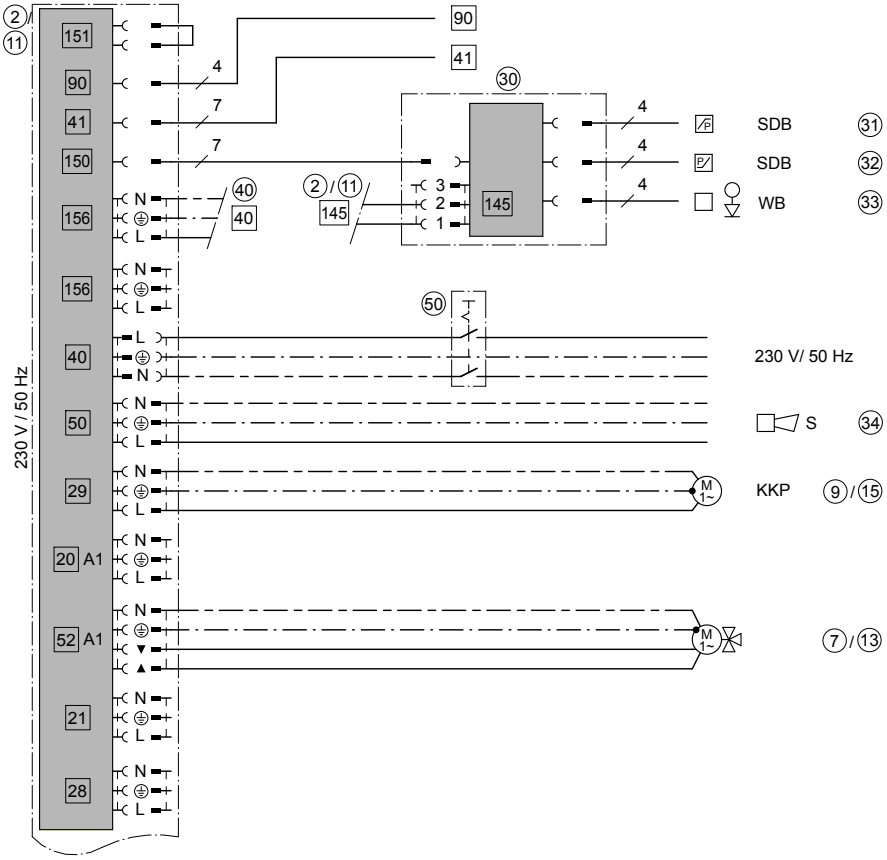
Pos.	Designation
①	**Boiler I**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
⑥	Flow temperature sensor (connection to higher third party control unit)
⑦	3-way mixing valve
⑧	Temperature sensor T1
⑨	Boiler circuit pump (on site)
⑤⓪	ON/OFF switch
⑩	**Boiler II**
⑪	Vitotronic 100, type GC1B
⑫	Boiler water temperature sensor KTS
⑬	3-way mixing valve
⑭	Temperature sensor T1
⑮	Boiler circuit pump (on site)
⑤⓪	ON/OFF switch
⑯	**DHW cylinder**
⑰	Cylinder temperature sensor (connection to higher third party control unit)
⑱	Circulation pump for cylinder heating (connection to higher third party control unit)
⑳	**Heating circuits**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
㉟	Flue gas temperature sensor AGS
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ Boiler enable, 3-way mixing valve, control mode/close
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉞	Central fault message system S
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V):
	■ Default of the set boiler water temperature and enable boiler

System example 6, ID: 4605428 (cont.)

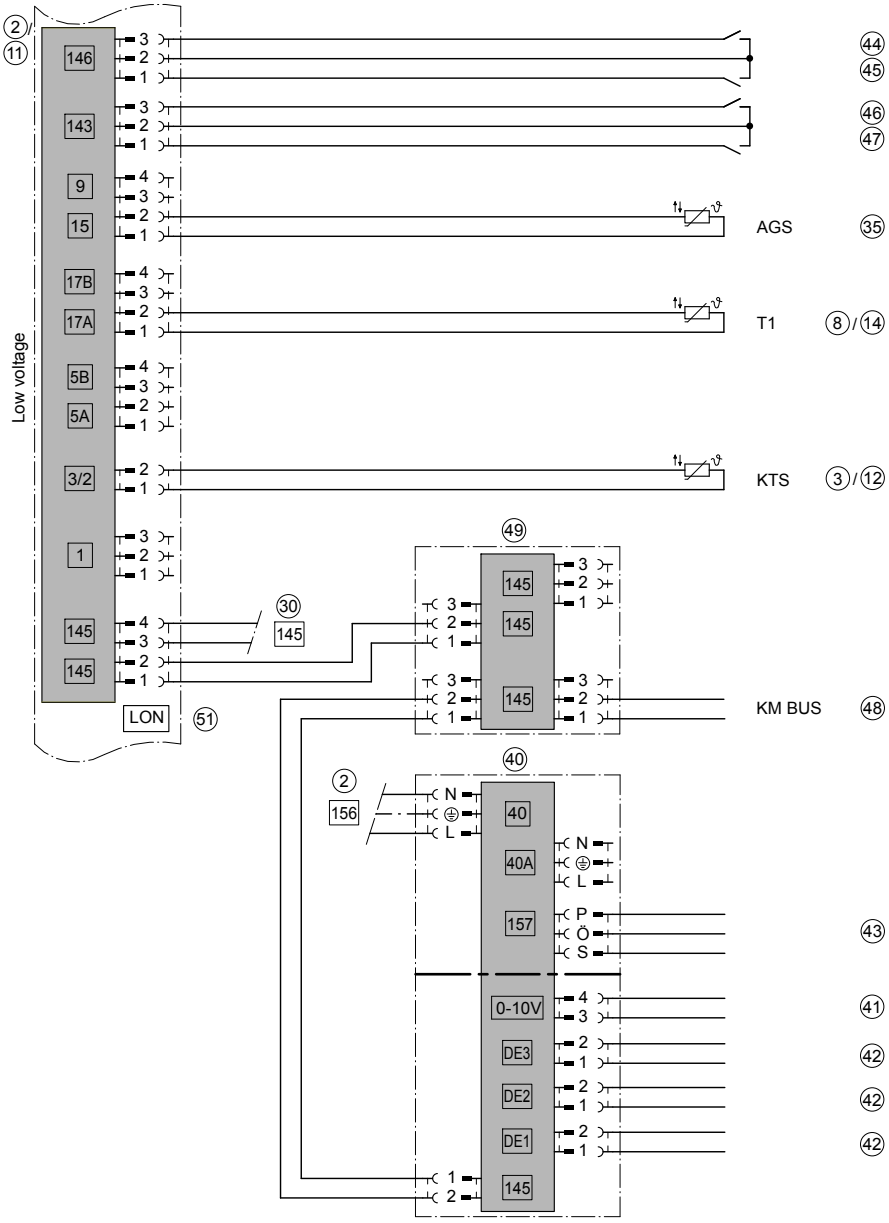
Pos.	Designation
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
㊸	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
㊽	Vitocom 100
㊾	KM BUS distributor, for several KM BUS subscribers
㊿	LON communication module for communication with external cascade control

System example 6, ID: 4605428 (cont.)

Electrical installation scheme



System example 6, ID: 4605428 (cont.)



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System example 6, ID: 4605428 (cont.)

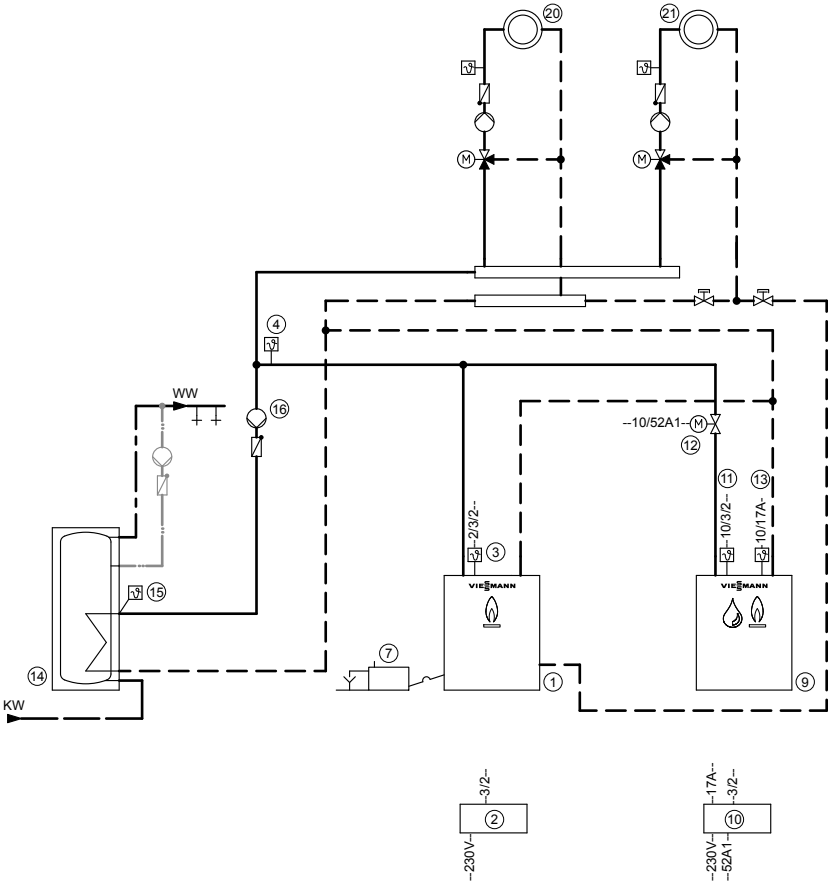
Required code

	Category	Function
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via LON.
01:3	2 **"Boiler"**	Multi boiler system with external cascade control via 0 – 10 V input or switching contacts.
0C:1	2 **"Boiler"**	Constant return temperature control.
4d:2	1 **"General"**	Boiler circuit pump at plug 29

System example 7, ID: 4605431

Multi boiler system: Vitocrossal and Vitoplex or Vitorond with Therm-Control (with a low temperature heating circuit)

Hydraulic installation scheme



System example 7, ID: 4605431 (cont.)

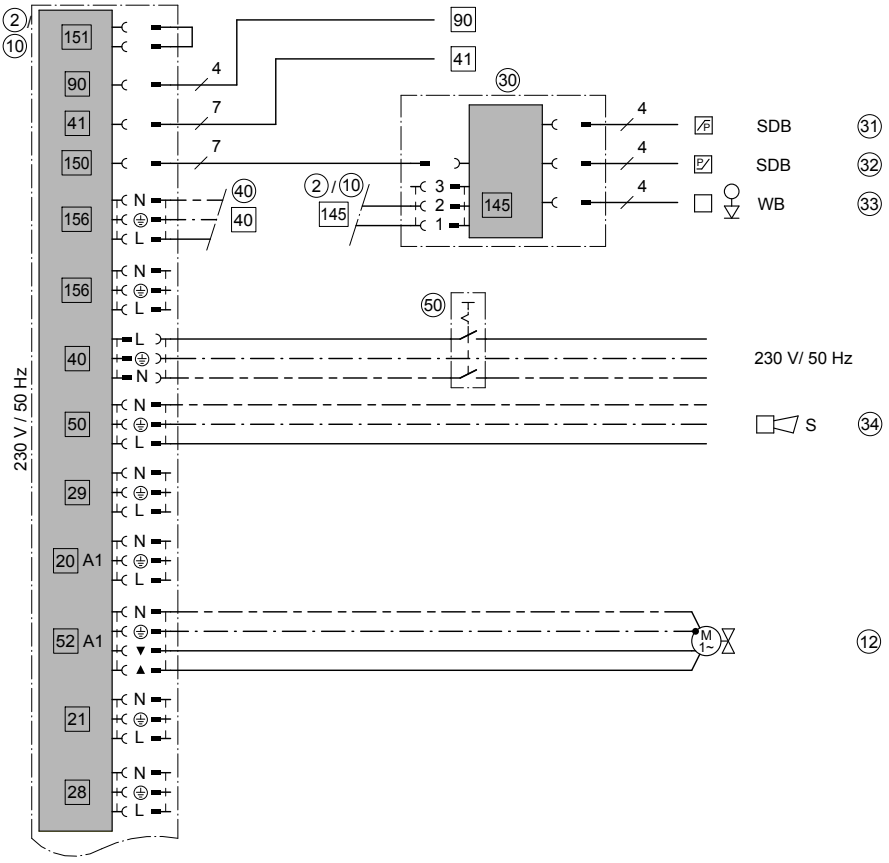
Equipment required

Pos.	Designation
①	**Boiler I**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
④	Flow temperature sensor (connection to higher third party control unit)
⑦	Neutralising system
⑤⓪	ON/OFF switch
⑨	**Boiler II**
⑩	Vitotronic 100, type GC1B
⑪	Boiler water temperature sensor KTS
⑫	Motorised butterfly valve
⑬	Therm-Control temperature sensor
⑤⓪	ON/OFF switch
⑭	**DHW cylinder**
⑮	Cylinder temperature sensor (connection to higher third party control unit)
⑯	Circulation pump for cylinder heating (connection to higher third party control unit)
⑳	**Heating circuit**
㉑	**Low temperature heating circuit**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
㉟	Flue gas temperature sensor AGS (not for Vitocrossal)
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ Enable boiler, butterfly valve open/closed
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉞	Central fault message system S
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V): ■ Default of the set boiler water temperature and enable boiler
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input

System example 7, ID: 4605431 (cont.)

Pos.	Designation
(43)	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
(48)	Vitocom 100
(49)	KM BUS distributor, for several KM BUS subscribers
(51)	LON communication module for communication with external cascade control

Electrical installation scheme



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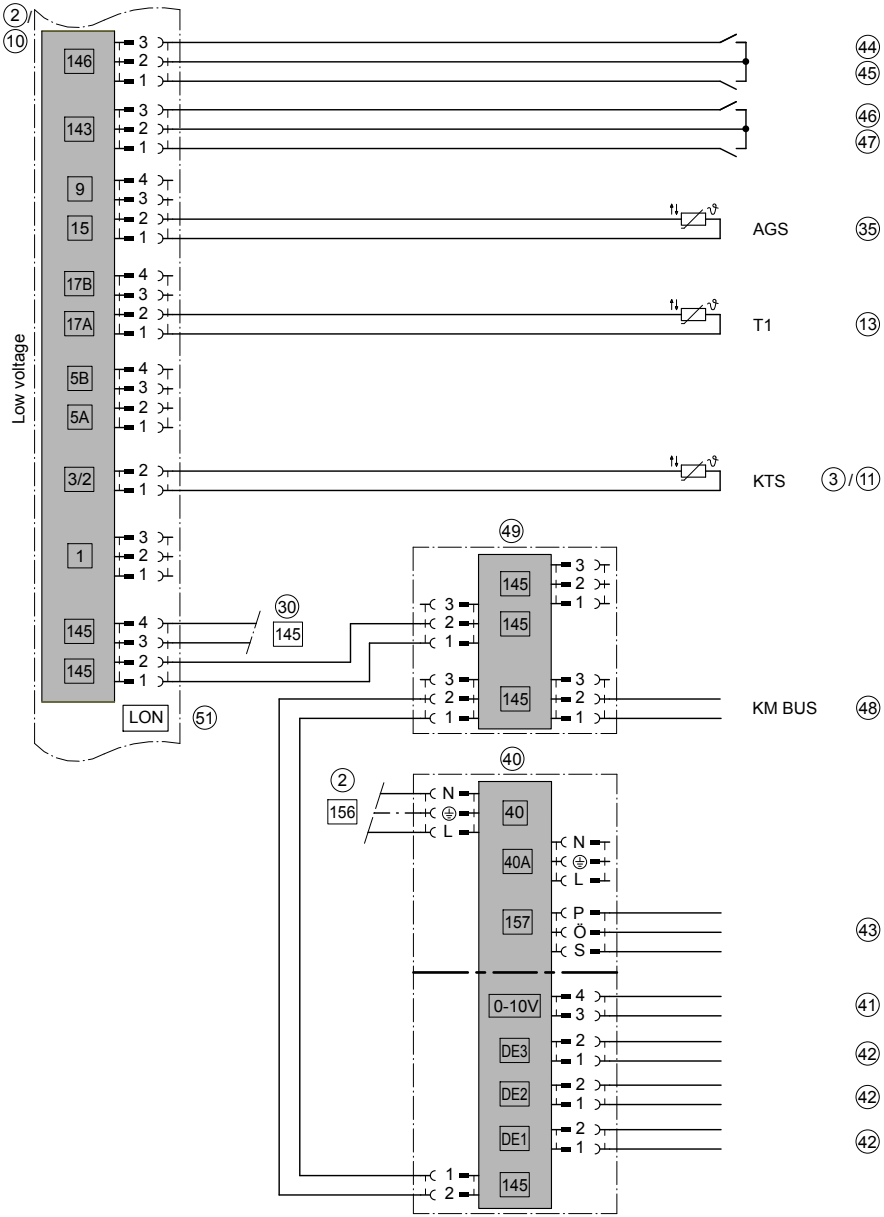
System example 7, ID: 4605431 (cont.)



System example 7, ID: 4605431 (cont.)

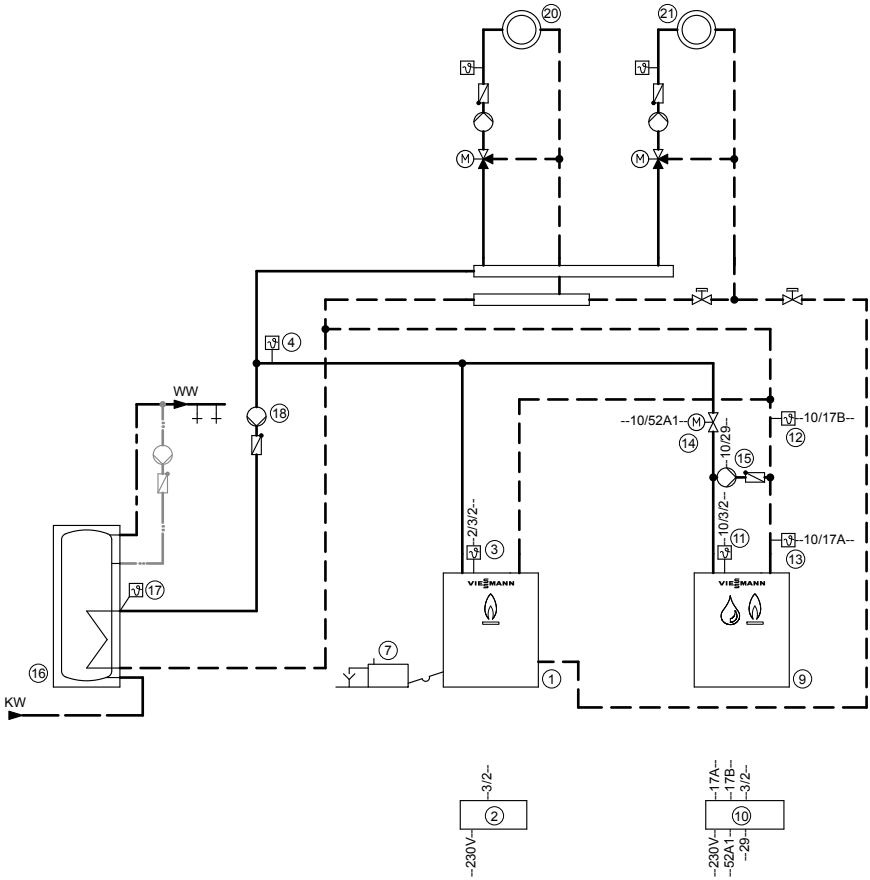
Required code

	Category	Function
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via LON.
01:3	2 **"Boiler"**	Multi boiler system with external cascade control via 0 – 10 V input or switching contacts.
0d:0	2 **"Boiler"**	Only with the Vitotronic 100 for Vitocrossal: Without Therm-Control.

System example 8, ID: 4605432

Multi boiler system: Vitocrossal and low temperature boiler with shunt pump for raising the return temperature (with a low temperature heating circuit)

Hydraulic installation scheme



System example 8, ID: 4605432 (cont.)

Equipment required

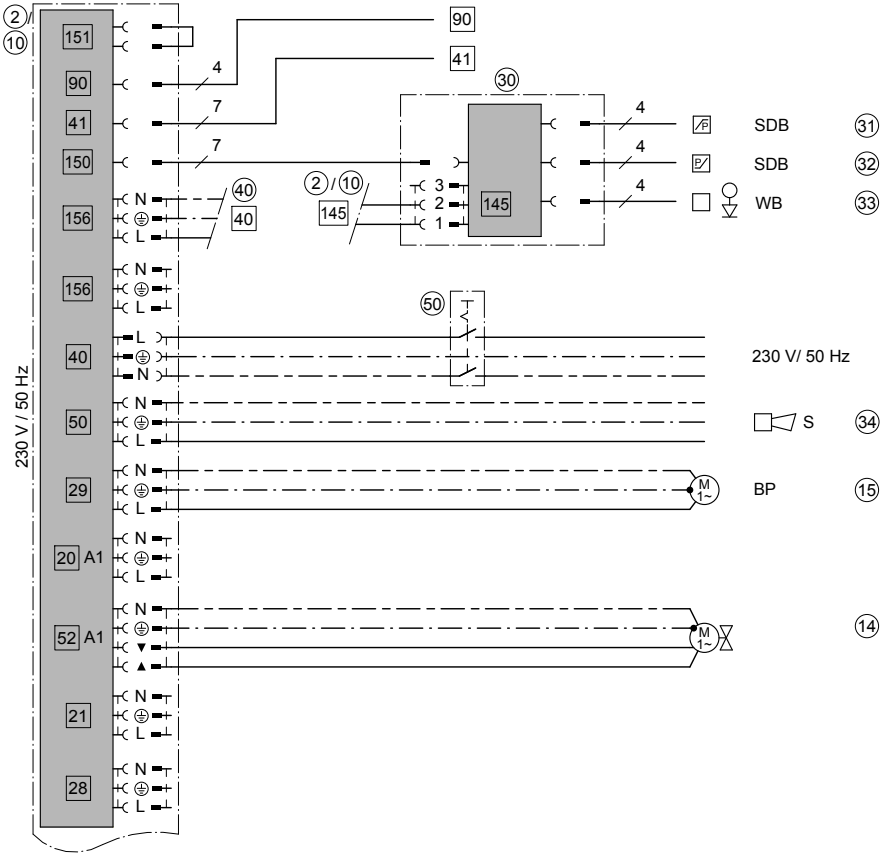
Pos.	Designation
①	**Boiler I**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
④	Flow temperature sensor (connection to higher third party control unit)
⑦	Neutralising system
⑳	ON/OFF switch
⑨	**Boiler II**
⑩	Vitotronic 100, type GC1B
⑪	Boiler water temperature sensor KTS
⑫	Temperature sensor T2
⑬	Temperature sensor T1
⑭	Motorised butterfly valve
⑮	Shunt pump (on site)
⑳	ON/OFF switch
⑯	**DHW cylinder**
⑰	Cylinder temperature sensor (connection to higher third party control unit)
⑱	Circulation pump for cylinder heating (connection to higher third party control unit)
⑳	**Heating circuit**
㉑	**Low temperature heating circuit**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
㉟	Flue gas temperature sensor AGS (not for Vitocrossal)
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ Enable boiler, butterfly valve open/closed
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉞	Central fault message system S
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V): ■ Default of the set boiler water temperature and enable boiler

System example 8, ID: 4605432 (cont.)

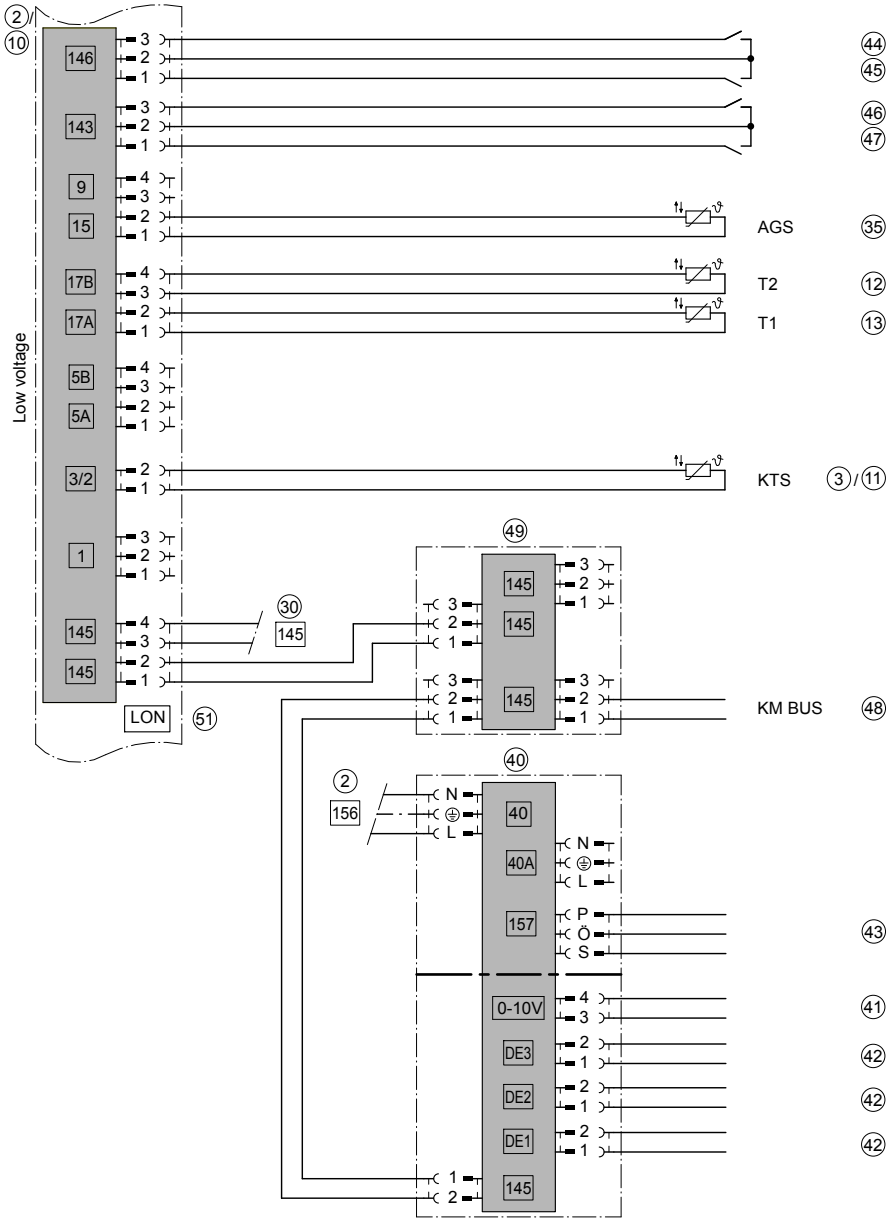
Pos.	Designation
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
㊸	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
㊽	Vitocom 100
㊾	KM BUS distributor, for several KM BUS subscribers
㊿	LON communication module for communication with external cascade control

System example 8, ID: 4605432 (cont.)

Electrical installation scheme



System example 8, ID: 4605432 (cont.)



System example 8, ID: 4605432 (cont.)

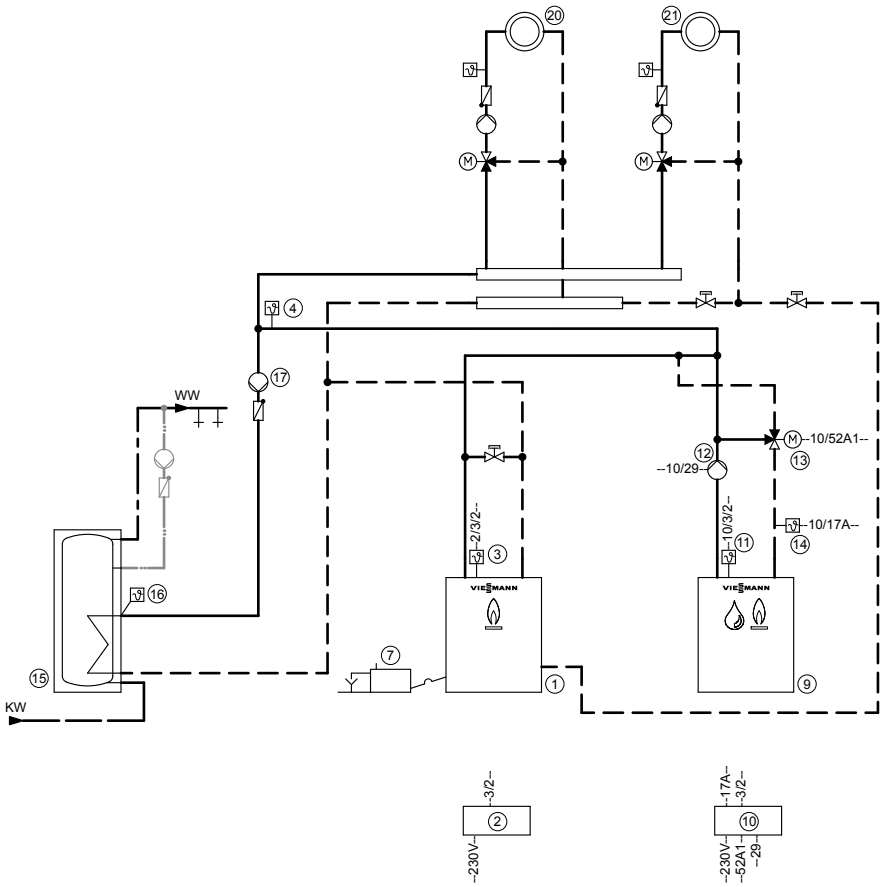
Required code

	Category	Function
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via LON.
01:3	2 **"Boiler"**	Multi boiler system with external cascade control via 0 – 10 V input or switching contacts.
0d:0	2 **"Boiler"**	Only with the Vitotronic 100 for Vitocrossal: Without Therm-Control.

System example 9, ID: 4605434

Multi boiler system: Vitocrossal and low temperature boiler with 3-way mixing valve and boiler circuit pump (with a low temperature heating circuit)

Hydraulic installation scheme



System example 9, ID: 4605434 (cont.)

Equipment required

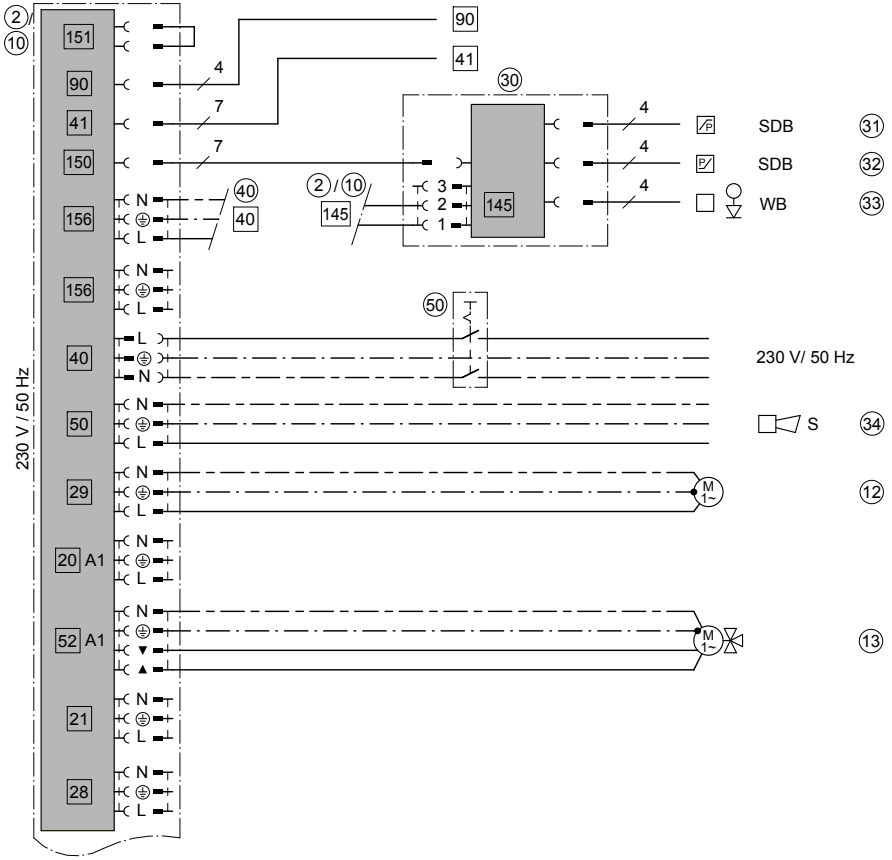
Pos.	Designation
①	**Boiler I**
②	Vitotronic 100, type GC1B
③	Boiler water temperature sensor KTS
④	Flow temperature sensor (connection to higher third party control unit)
⑦	Neutralising system
⑤⓪	ON/OFF switch
⑨	**Boiler II**
⑩	Vitotronic 100, type GC1B
⑪	Boiler water temperature sensor KTS
⑫	Boiler circuit pump
⑬	3-way mixing valve
⑭	Temperature sensor T1
⑤⓪	ON/OFF switch
⑮	**DHW cylinder**
⑯	Cylinder temperature sensor (connection to higher third party control unit)
⑰	Circulation pump for cylinder heating (connection to higher third party control unit)
⑳	**Heating circuit**
㉑	**Low temperature heating circuit**
	Boiler accessories
㉚	Plug-in adaptor for external safety equipment
㉛	Minimum pressure limiter SDB
㉜	Maximum pressure limiter SDB
㉝	Water level limiter (low water indicator) WB
㉟	Flue gas temperature sensor AGS (not for Vitocrossal)
	External hook-ups (for connection to a higher third party control unit, see page 78):
㊹	■ Boiler enable, control mode/close
㊺	■ External changeover of stepped/modulating burners
㊻	■ External demand burner stage 2
㊼	■ External demand burner stage 1
	System accessories
㉞	Central fault message system S
㊵	Extension EA 1
㊶	1 analogue input (0 – 10 V): ■ Default of the set boiler water temperature and enable boiler

System example 9, ID: 4605434 (cont.)

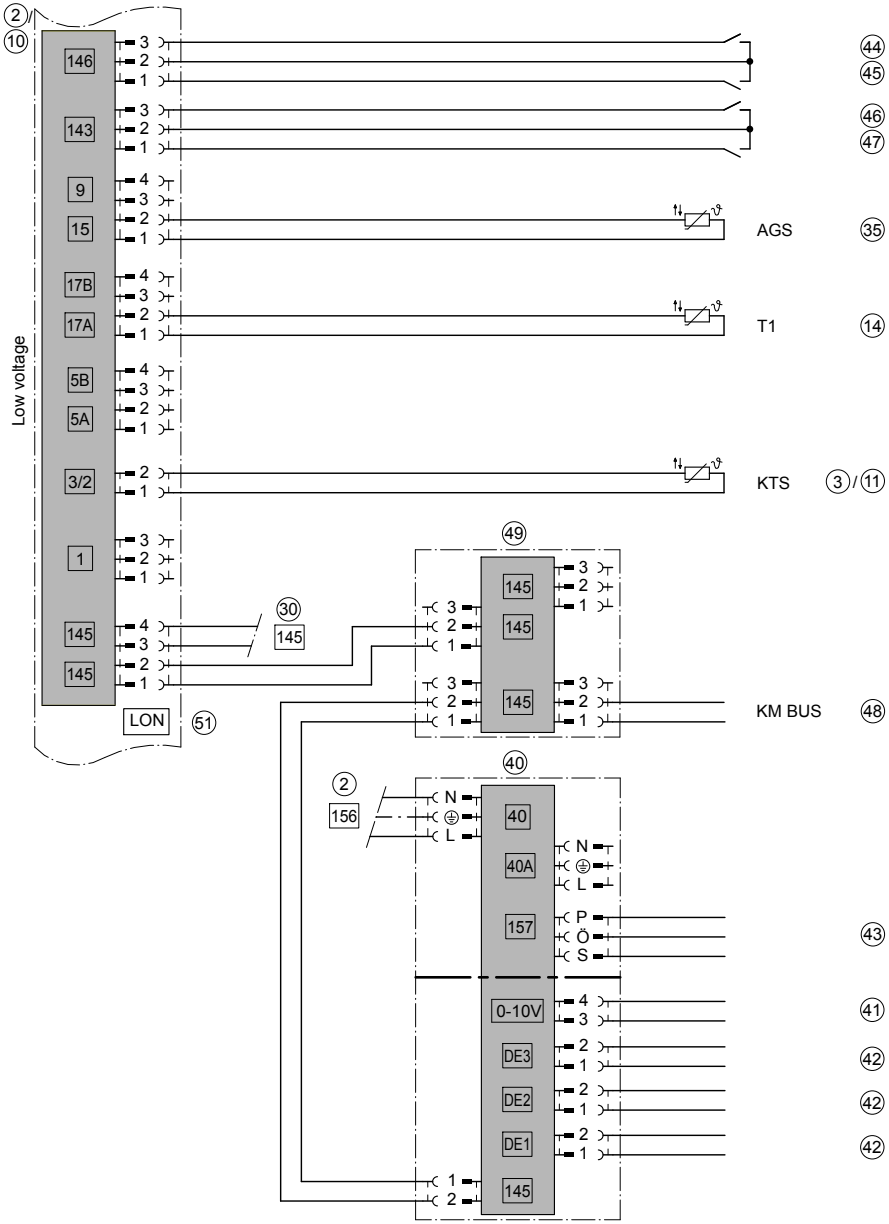
Pos.	Designation
㊷	3 digital inputs: ■ External blocking ■ External blocking with fault message ■ Fault message input
㊸	1 switching output (floating changeover contact): ■ Switching a feed pump to a substation
㊽	Vitocom 100
㊾	KM BUS distributor, for several KM BUS subscribers
㊿	LON communication module for communication with external cascade control

System example 9, ID: 4605434 (cont.)

Electrical installation scheme



System example 9, ID: 4605434 (cont.)



System example 9, ID: 4605434 (cont.)

Required code

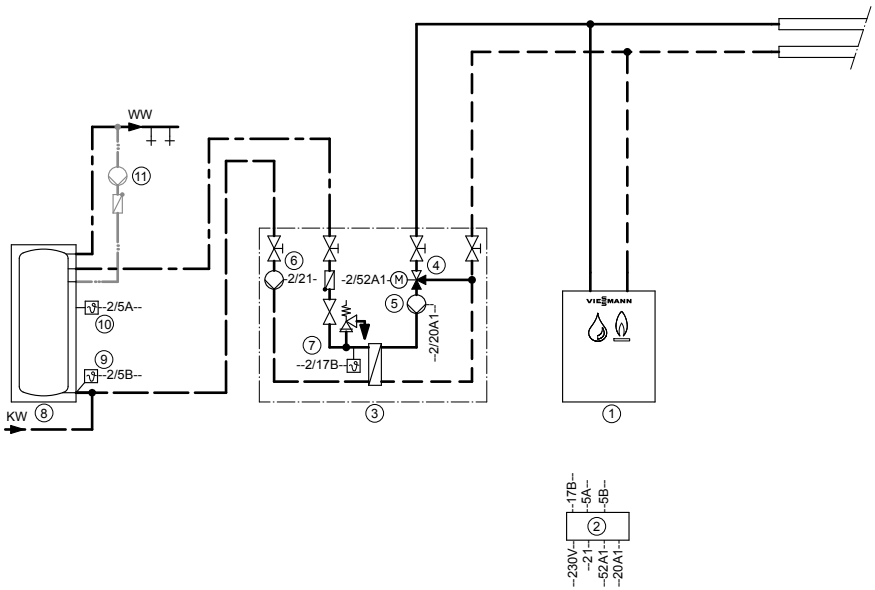
	Category	Function
01:2	2 **"Boiler"**	Multi boiler system with external cascade control via LON.
01:3	2 **"Boiler"**	Multi boiler system with external cascade control via 0 – 10 V input or switching contacts.
0C:1	2 **"Boiler"**	Only with the Vitotronic 100 for low temperature boilers: Constant return temperature control.
0d:0	2 **"Boiler"**	Only with the Vitotronic 100 for Vitocrossal: Without Therm-Control.
4d:2	1 **"General"**	Only with the Vitotronic 100 for low temperature boilers: Boiler circuit pump at plug 29

System extension

DHW heating with primary store system; ID: 4605085

- Only in conjunction with single boiler systems.
- In systems with temporarily high DHW demand and large cylinder capacity with offset draw-off times.

System extension (cont.)

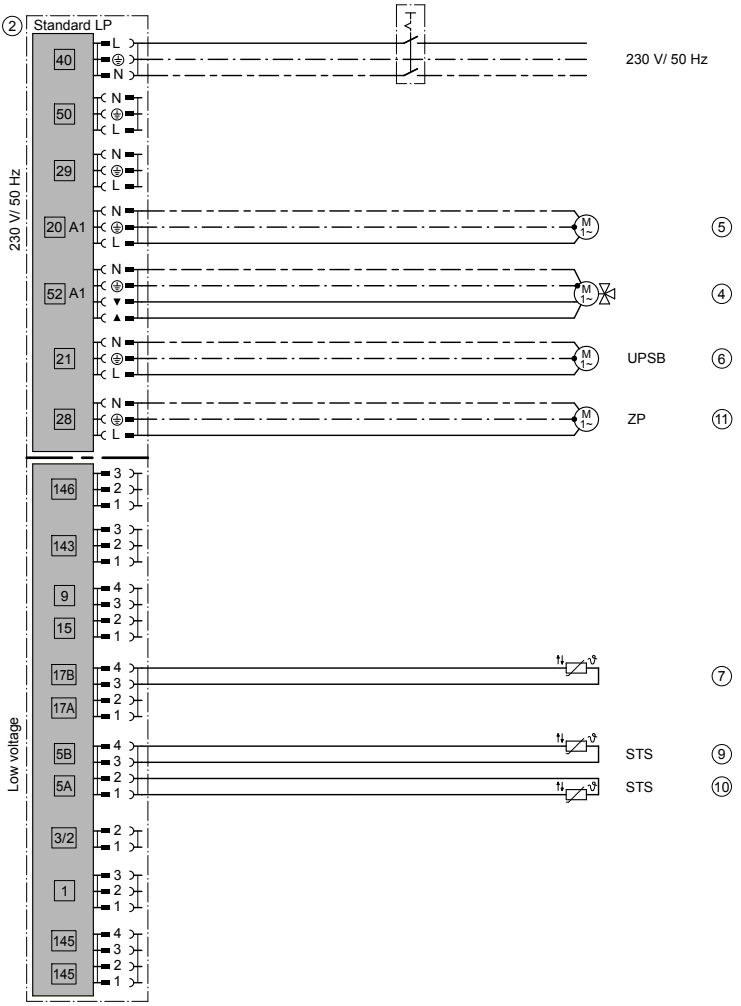


Equipment required

Pos.	Designation
①	**Boiler**
②	Vitotronic 100, type GC1B
③	**Vitotrans 222 (heat exchanger set)**
④	3-way mixing valve (standard delivery of mixer assembly, accessory for Vitotrans 222)
⑤	Primary pump in the primary store system
⑥	Secondary pump in the primary store system UPSB
⑦	Temperature sensor (standard delivery of mixer assembly, accessory for Vitotrans 222)
⑧	**DHW cylinder**
⑨	Cylinder temperature sensor STS, bottom (standard delivery of mixer assembly, accessory for Vitotrans 222)
⑩	Cylinder temperature sensor STS, top (control unit accessory)
⑪	DHW circulation pump ZP (on-site)

System extension (cont.)

Electrical installation scheme

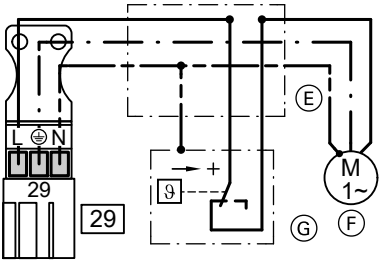


System extension (cont.)

Required code

	Category	Function
4C:1	1 **"General"**	Primary pump connection at plug 20 A1.
4E:2	1 **"General"**	Motor connection for 3-way mixing valve at plug 52 A1.
55:3	3 **"DHW"**	Cylinder temperature controller, primary store system.
6A:113	3 **"DHW"**	For Vitotrans 222 heat exchanger set 240 kW: Servomotor runtime, mixing valve 113 s.

In conjunction with shunt pump for raising the return temperature



Sensor input 17 B is used to control the Vitotrans 222. Therefore, the shunt pump must be switched by a separate temperature controller.
Required code: "4d:2" in category 1 **"General"**.

Ⓔ Junction box (on site)
Ⓕ Shunt pump
Ⓖ Control thermostat, Part no. Z001 886

In conjunction with system example 2

A separate Vitotronic 200-H must be used for regulating the Vitotrans 222.

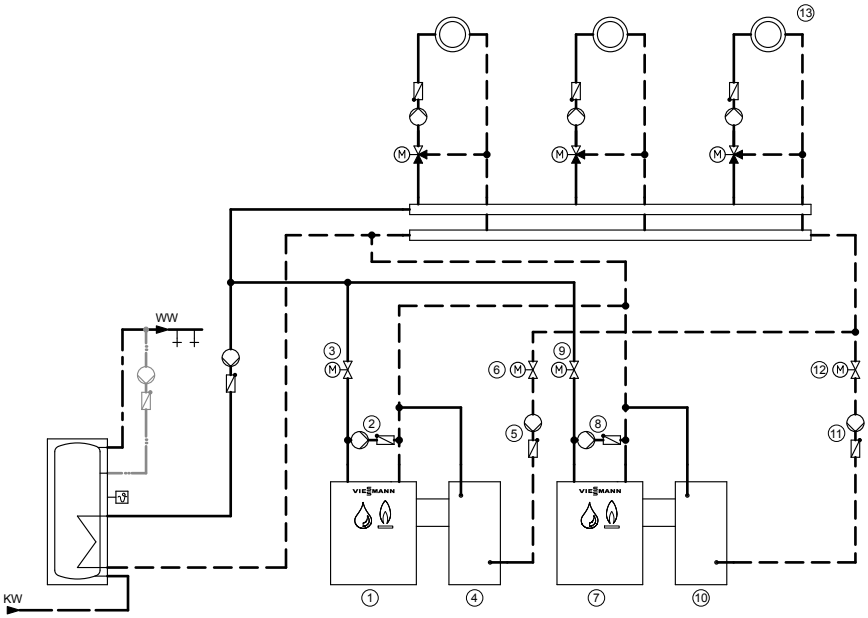
The boiler control unit affects the constant return temperature control (see coding address "4E" in category 1 **"General"**).

System extension (cont.)

System with flue gas/water heat exchanger

System with flue gas/water heat exchanger, with shunt pump, ID: 4605083

Hydraulic installation scheme



Equipment required

Pos.	Designation
①	**Boiler I**
②	Shunt pump
③	Motorised butterfly valve
⑦	**Boiler II**
⑧	Shunt pump
⑨	Motorised butterfly valve
④	**Vitotrans 300 I**
⑤	Circulation pump
⑥	Motorised butterfly valve

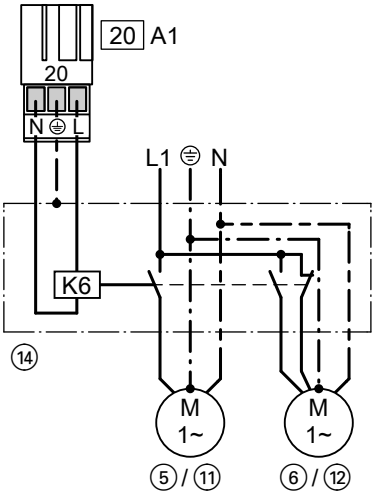
System extension (cont.)

Pos.	Designation
⑩	**Vitotrans 300 II**
⑪	Circulation pump
⑫	Motorised butterfly valve
⑬	**Low temperature heating circuit**
⑭	Contactor relay

Wiring diagram

Connection of circulation pump and motorised butterfly valve for the flue gas/water heat exchanger.
If the circulation pump power consumption is above 2 A, use a contactor relay.

Note
The shunt pump and motorised butterfly valve are connected at the relevant Vitotronic 100.
If plug 20 A1 has already been assigned, make the connection at extension AM1 (accessory; see page 63).



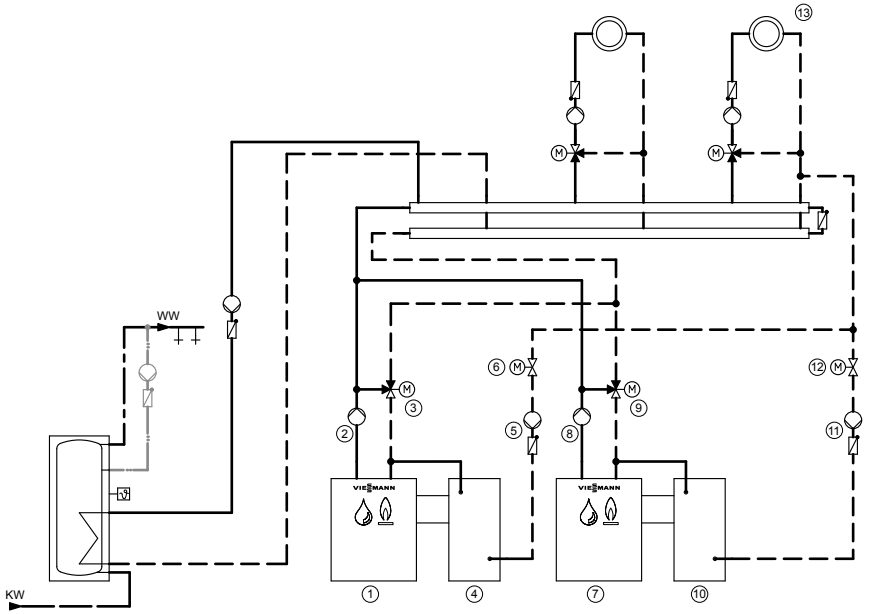
Code required at every Vitotronic 100

	Category	Function
4C:3	1 **"General"**	Flue gas/water heat exchanger circulation pump connection at plug 20 A1.

System extension (cont.)

System with flue gas/water heat exchanger, with boiler circuit pump, ID: 4605084

Hydraulic installation scheme



Equipment required

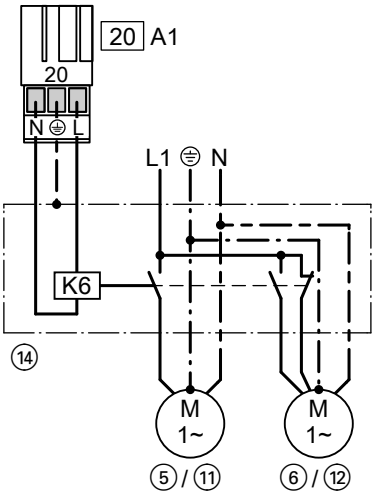
Pos.	Designation
①	**Boiler I**
②	Boiler circuit pump
③	3-way mixing valve
⑦	**Boiler II**
⑧	Boiler circuit pump
⑨	3-way mixing valve
④	**Vitotrans 300 I**
⑤	Circulation pump
⑥	Motorised butterfly valve
⑩	**Vitotrans 300 II**
⑪	Circulation pump
⑫	Motorised butterfly valve

System extension (cont.)

Pos.	Designation
⑬	**Low temperature heating circuit**
⑭	Contactor relay

Wiring diagram

Connection of circulation pump and motorised butterfly valve for the flue gas/water heat exchanger.
If the circulation pump power consumption is above 2 A, use a contactor relay.



Note
The boiler circuit pump and 3-way mixing valve are connected at the relevant Vitotronic 100.
If plug 20 A1 has already been assigned, make the connection at extension AM1 (accessory; see page 63).

Code required at every Vitotronic 100

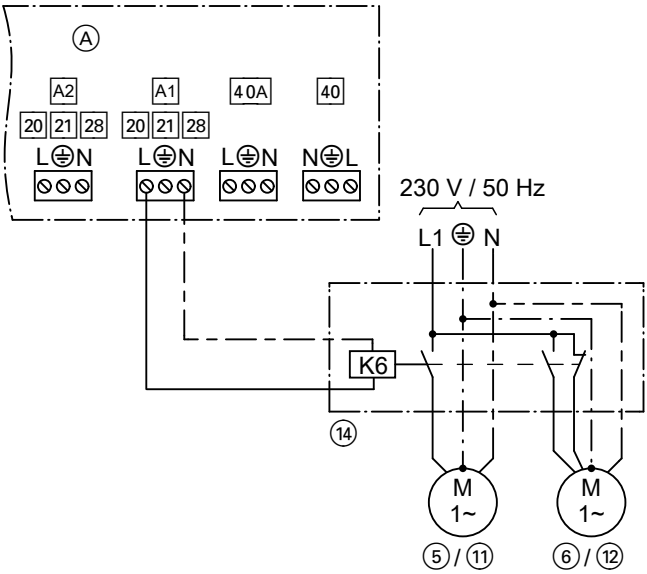
	Category	Function
0C:1	2 **"Boiler"**	Constant return temperature control.
4C:3	1 **"General"**	Flue gas/water heat exchanger circulation pump connection at plug 20 A1.
4d:2	1 **"General"**	Boiler circuit pump connection at plug 29.

System versions where output 20 A1 is already used as a switching contact

Use extension AM1 Ⓐ (accessory).

If the circulation pump power consumption is above 2 A, use a contactor relay.

System extension (cont.)



Rated current	4(2) A~
Recommended Connecting cable	H05VV-F3G 0.75 mm^2 or H05RN-F3G 0.75 mm^2

Code required at every Vitotronic 100

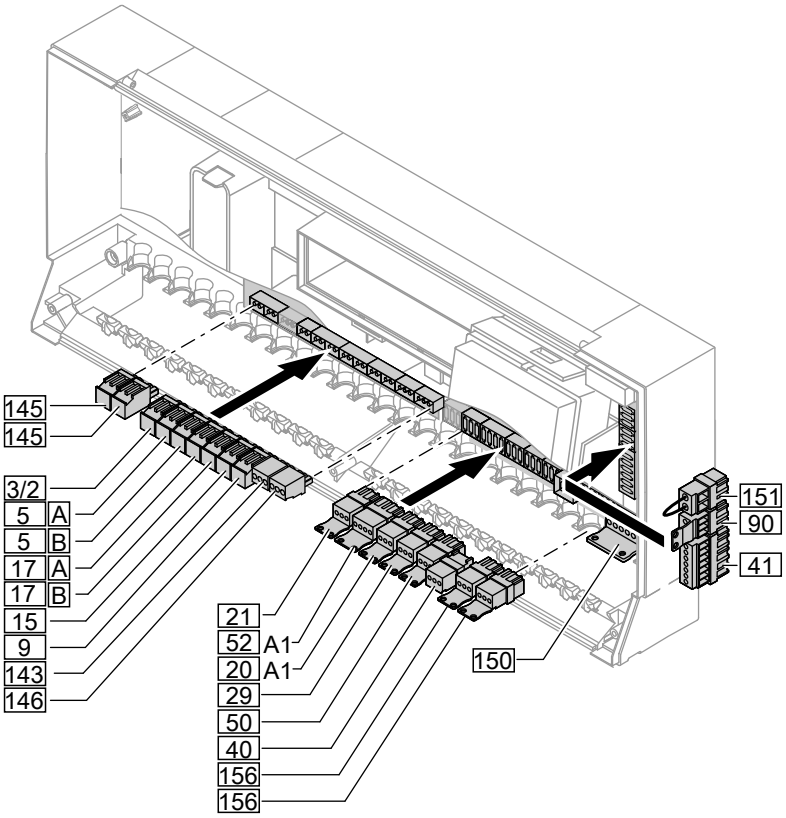
	Category	Function
33:3	1 **"General"**	Function output A1 at extension AM1: Circulation pump – flue gas/water heat exchanger.

Overview of electrical connections

Note

When connecting plugs 143, 146 and 21, bundle the individual wires of the cables closely to the terminals.

This prevents the wires from drifting into the adjacent voltage area.



Main PCB, low voltage

- 3 Boiler water temperature sensor
- 5 A Cylinder temperature sensor
- 5 B Cylinder temperature sensor 2 for primary store system (accessory)
- 9 Flow temperature sensor, low loss header
- 15 Flue gas temperature sensor (accessories)
- 17 A Therm-Control temperature sensor
  or
  Return temperature sensor T1 (accessory)

Overview of electrical connections (cont.)

17 B Return temperature sensor T2 (accessory)
or
temperature sensor primary store system (accessories)
143 External hook-up
145 KM BUS subscriber (accessory)
146 External hook-up

- When connecting external switching contacts or components to the safety low voltage circuit of the control unit, observe the safety requirements of safety category II, i.e. 8.0 mm air and creep paths or 2.0 mm insulation thickness towards 'live' components.
- For all on-site components (incl. PC/ laptops), ensure safe electrical separation to EN 60 335 or IEC 65.

Main PCB 230 V~

20 A1 Primary pump, primary store system
or
Circulation pump – flue gas/ water heat exchanger
or
Switching output
21 Circulation pump for cylinder heating (accessory)
29 Shunt pump or boiler circuit pump (on site)
40 Power supply
41 Burner stage 1
50 Central fault message
52 A1 Butterfly valve
or
Mixer motor, return temperature raising facility
or
Motor for 3-way mixing valve, primary store system
90 Burner stage 2/mod.
150 External connections, e.g. supplementary safety equipment
151 Safety chain, potential free
156 Power supply for accessories

Inserting cables and applying strain relief

Control unit fitted on the boiler

- Route cables from below through the front panel of the boiler into the wiring chamber of the control unit.

Control unit fitted to the boiler side

- Route cables from below out of the cable channel into the control unit.

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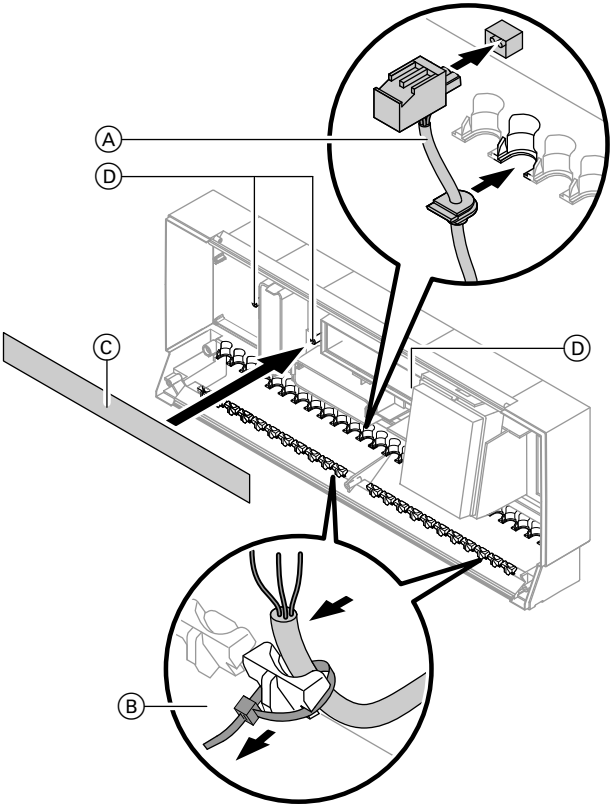
Inserting cables and applying strain relief (cont.)

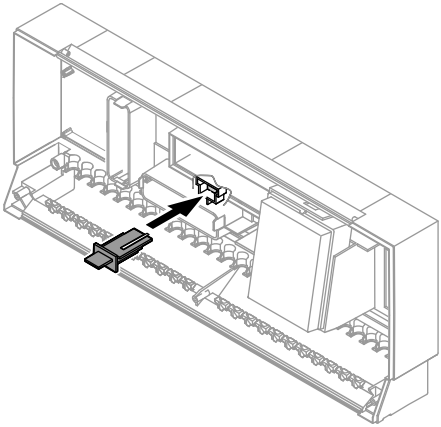


Ⓐ Cables with moulded strain relief
Ⓑ On-site cables; strip up to 100 mm insulation
Ⓒ Plug connection diagram
Ⓓ Cover for plug connection diagram

Inserting the boiler coding card

Only use the boiler coding card included in the boiler standard delivery (also see table on page 169).

Inserting the boiler coding card (cont.)



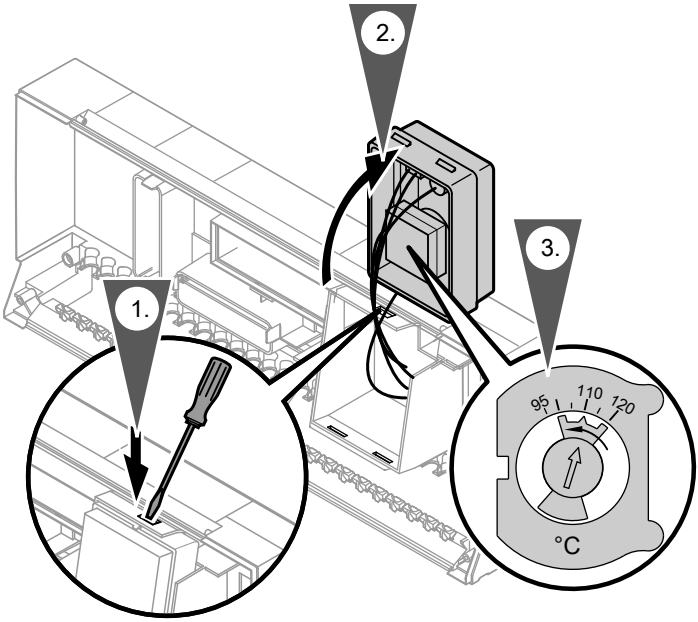
Insert the boiler coding card through the recess in the cover into slot "X7".

Adjusting the high limit safety cut-out (if required)

The high limit safety cut-out is supplied with a factory setting of 110 °C.

Adjusting the high limit safety cut-out (if… (cont.)

Adjustment to 100 °C



Changing the temperature controller setting (if required)

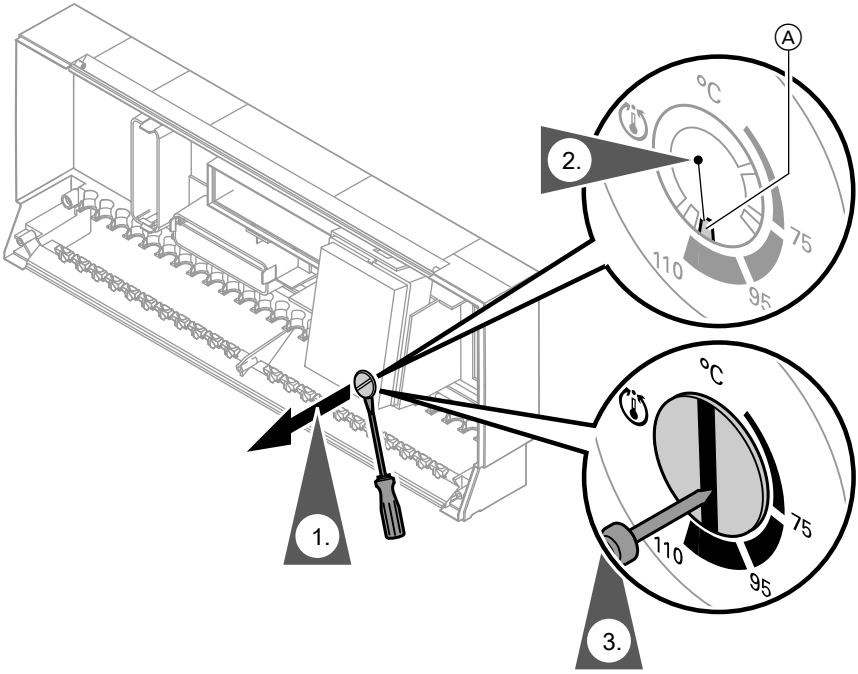
The temperature controller is supplied with a factory setting of 95 °C.

Changing the temperature controller setting (if… (cont.)

Adjustment to 100 °C

! **Please note**
Excessive DHW temperatures can damage the DHW cylinder.

If the system is operated in conjunction with a DHW cylinder, ensure that the maximum permissible water temperature is not exceeded. If necessary, install suitable safety equipment for this purpose.



Ⓐ 75 to 100 °C

1. Remove rotary selector "".
2. Using a pair of pointed pliers, break cam Ⓐ identified in the illustration out of the stop dial.
3. Fit rotary selector "" so that the marking lies at the centre of the selected range. Turn rotary selector "" fully clockwise.

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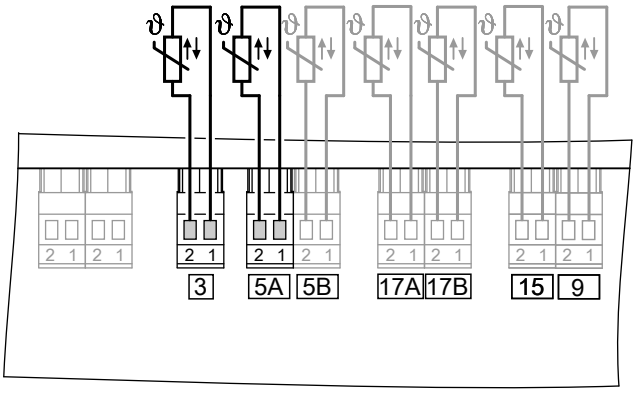
Connecting sensors



Main PCB, low voltage

- 3 Boiler water temperature sensor
- 5 A Cylinder temperature sensor
- 5 B Cylinder temperature sensor 2 for primary store system (accessory)
- 9 Flow temperature sensor, low loss header
- 15 Flue gas temperature sensor (accessories)
- 17 A Therm-Control temperature sensor
  or
  Return temperature sensor T1 (accessory)
- 17 B Temperature sensor T2 (accessory)
  or
  temperature sensor primary store system (accessories)

Connecting pumps

Available pump connections

- 20 A1 Primary pump, primary store system
  or
  Circulation pump – flue gas/ water heat exchanger
- 21 Circulation pump for cylinder heating
- 29 Shunt pump or boiler circuit pump

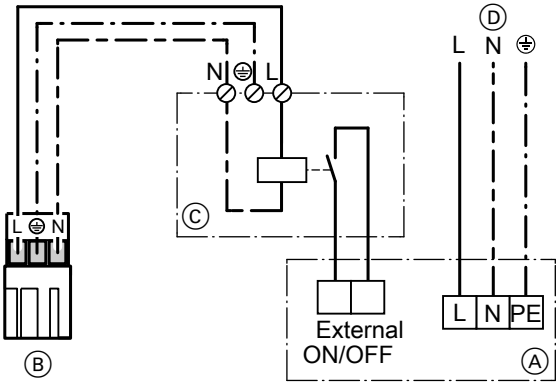
Connecting pumps (cont.)

Pumps 230 V~

Rated current	4(2) A~
Recommended connecting cable	H05VV-F3G 0.75 mm² or H05RN-F3G 0.75 mm²

Ⓐ Pump
Ⓑ To the control unit

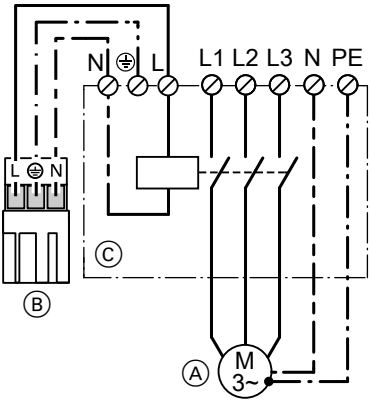
Pumps with power consumption greater than 2 A



Ⓐ Pump
Ⓑ To the control unit
Ⓒ Contactor
Ⓓ Separate power connection (observe manufacturer's details)

Connecting pumps (cont.)

Pumps 400 V~



For switching the contactor

Rated current	4(2) A~
Recommended connecting cable	H05VV-F3G 0.75 mm^2 or H05RN-F3G 0.75 mm^2

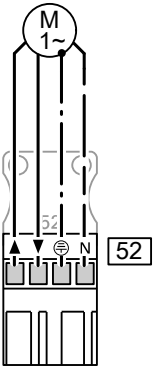
Ⓐ Pump
Ⓑ To the control unit
Ⓒ Contactor

Connecting servomotors

Available connections

52 A1 Motorised butterfly valve
or
Mixer motor for return temperature raising facility
or
Motor for 3-way mixing valve, primary store system

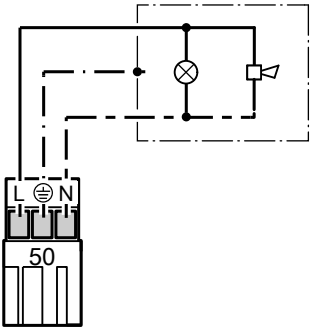
Connecting servomotors (cont.)



Rated voltage	230 V~
Rated current	max. 0.2 (0.1) A~
Recommended Connecting cable	H05VV-F4G 0.75 mm² or H05RN-F4G 0.75 mm²
Runtime	5 to 199 s, adjustable via coding address "40"

▲ Open
▼ Close

Connecting the central fault message facility



Rated voltage	230 V~
Rated current	max. 4 (2) A~
Recommended connecting cable	H05VV-F3G 0.75 mm² or H05RN-F3G 0.75 mm²

Connecting the external safety equipment

Connection via **plug** 150.
The plug-in adaptor for external safety equipment (accessory, see chapter "Components") can be used for connecting several pieces of safety equipment.

Note
Plug 150 ***must*** *remain plugged in, even if no connection is made.*

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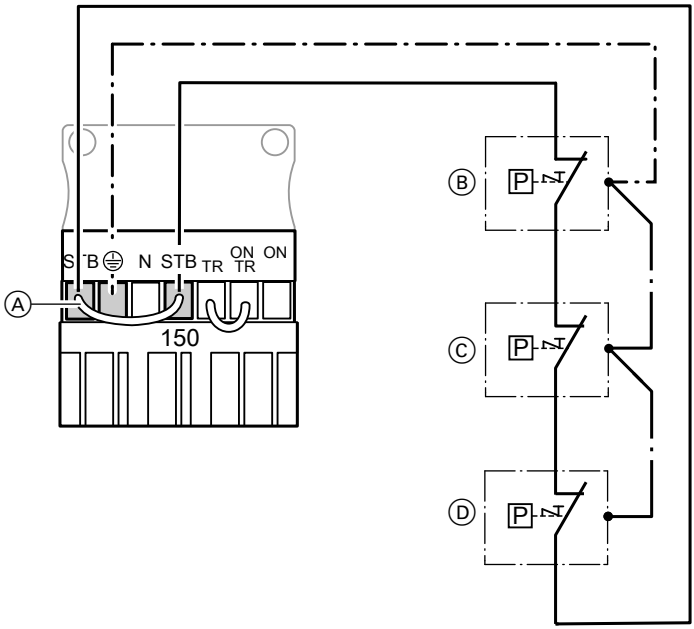
Connecting the external safety equipment (cont.)

! **Please note**
'Live' contacts lead to short circuits or phase failure.

The external connections must be **potential-free**.

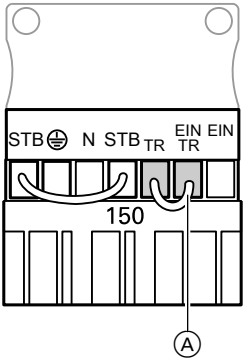


Ⓐ Jumper "STB" – "STB"
Ⓑ Low water indicator, minimum pressure limiter
Ⓒ Maximum pressure limiter
Ⓓ Further safety equipment

1. Remove jumper "STB" – "STB".

2. Connect the external safety equipment in series to plug 150.

Provisional burner operation



Insert jumper "TR" – "ON/TR" at "TR" – "ON".
The boiler is heated up with burner stage 1 or the lower heating output. Shutdown takes place via the temperature controller.

Ⓐ Jumper "TR" – "ON/TR"

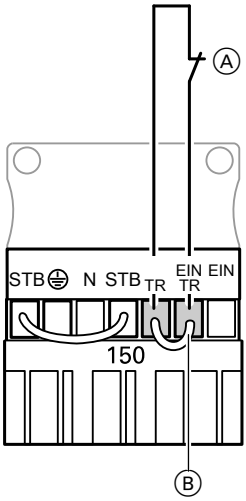
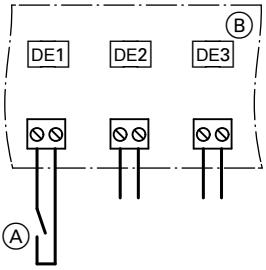
External blocking – single boiler system

Connection options (floating contact) at:
- Plug 150
- Extension EA1 (accessory, see page 173)

Connection

! **Please note**
'Live' contacts lead to short circuits or phase failure.
The external connection **must be potential-free**.

External blocking – single boiler system (cont.)

Plug 150	Extension EA1
 Ⓐ Floating contact Ⓑ **Remove** jumper "TR" – "ON/TR"	 Ⓐ Floating contact Ⓑ Extension EA1
Opening this contact leads to a controlled burner shutdown. ***Note*** *Connect **only** safety shutdown equipment, e.g. temperature limiter, to these terminals.*	Closing this contact leads to a controlled burner shutdown. Any connected shunt or boiler circuit pump is stopped.

! **Please note**
The heating system has **no frost protection** during blocking.
The boiler is not held at the lower boiler water temperature.

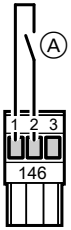
Code

Set "5d", "5E" or "5F" in category 1 **"General"** to 3 or 4.

External changeover of multi stage/modulating burners

Connection at plug 146.

! **Please note**
'Live' contacts lead to short circuits or phase failure.
The external connection **must be potential-free**.



Ⓐ External changeover (floating contact)

Contact open: modulating mode
Contact closed: two stage mode

Code

Set code "02:2" in group 2 **"Boiler"**.

Note
When scanning the burner version, the address for modulation appears even after an external changeover (no rewriting).

Single boiler system – connecting an external control unit

Settings

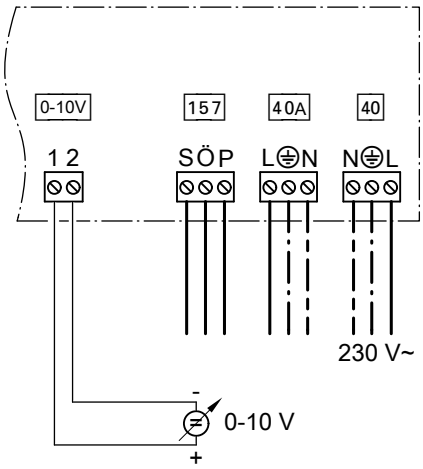
- Codes in category 2 **"Boiler"**:
  - "02:1" for two-stage burner
  - "02:2" for modulating burner
  - "01:1" for single boiler system (delivered condition)
- The boiler water temperature must be set to the lower value.
  The boiler is held at the required minimum temperature.
- The cylinder temperature controller is activated when a cylinder temperature sensor is connected.
- The high limit safety cut-out settings and other settings depend on the system equipment level along with safety equipment to EN 12828 or EN 12953.

Single boiler system – connecting an… (cont.)

High limit safety cut-out	110 °C	100 °C
Temperature controller	100 °C	87 °C
Electronic maximum boiler water temperature limit, coding address "06" in group 2 **"Boiler"** at the Vitotronic 100	95 °C	85 °C
Maximum temperature of the on-site control unit	90 °C	80 °C

External demand via 0 – 10 V input

Connection at 0 – 10 V input at **extension EA1** (see page 173).



0 - 1 V ≙ "No default set boiler water temperature"
1 V ≙ Set value 10 °C
10 V ≙ Set value 100 °C
Observe coding address "1E" in the **"General"** category.

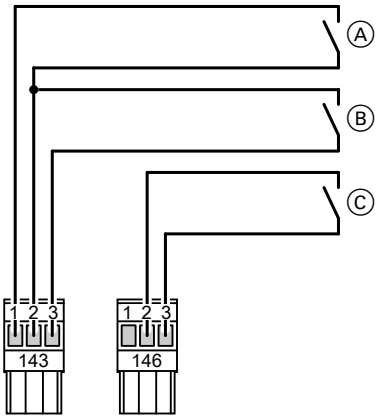
External demand via switching contacts

Connection at plug 143/146 of the control unit.
The set boiler water temperature is adjusted via code "9b" in category 1**"General"**.

Two-stage burner

Ⓐ, Ⓑ and Ⓒ are floating contacts of the higher control unit.

Single boiler system – connecting an… (cont.)



Ⓐ Burner stage 1 "ON"
Ⓑ Burner stage 2 "ON"
Ⓒ External load-dependent starting

External burner start – burner stage 1

Contact at terminals "1" and "2" of plug 143:

- Contact closed:
  Burner stage 1 is switched on.
  Burner stage 2 is switched ON only for maintaining the minimum temperature.
  The boiler water temperature is limited by the electronic maximum temperature limiter, if that is set below that of mechanical temperature controller.
- Contact open:
  Burner stage 1 is switched off.

External burner start – burner stage 1 and 2

Contact at terminals "2" and "3" of plug 143

- Contact closed:
  Both burner stages are switched ON.
  The boiler water temperature is limited by the electronic maximum temperature limiter, if it is set below that of mechanical control thermostat "".
  Burner stage 2 is switched OFF 2 K sooner.
- Contact open:
  Burner stages 1 and 2 are switched OFF.

External starting subject to load

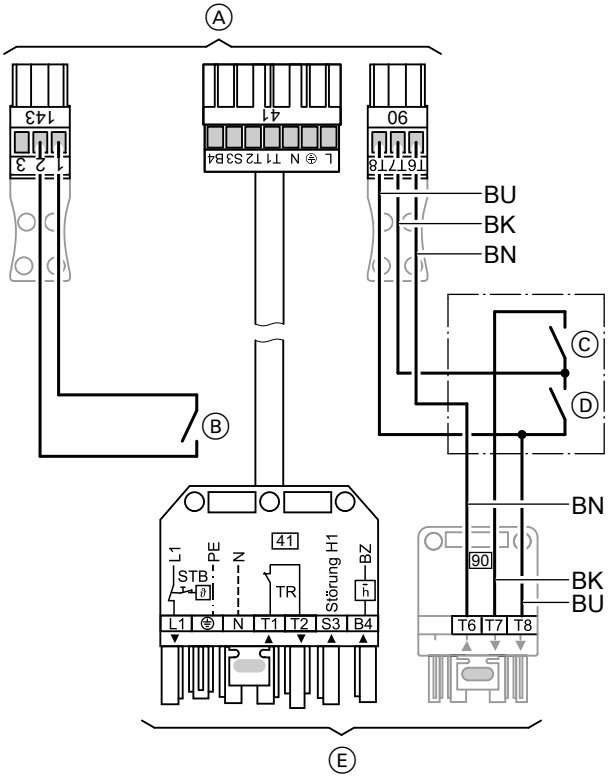
The burner is started, subject to load, when the zero volt contact across terminals "2" and "3" at plug-in connector 146 closes.
The boiler will be constantly operated at the set temperature.
The boiler water temperature is limited via the maximum set boiler water temperature or via the mechanical control thermostat.
The set value is adjusted via code "9b".

Single boiler system – connecting an… (cont.)

Low temperature boiler with modulating burner (on-site modulation controller)

Burner connection:

- Connect plug 41 of Vitotronic 100 to the burner.
- Plug 90 from the Vitotronic 100 via modulation controller (on site) to plug 90 on the burner.
- Set the minimum temperature at the higher control unit with the modulation controller 5 K higher than the lower boiler water temperature.



Ⓐ Plug to the control unit

Ⓑ Burner with base load "ON"

Single boiler system – connecting an… (cont.)

Ⓒ Reduce burner output (modulation controller)
Ⓓ Increase burner output (modulation controller)

Colour coding to DIN IEC 60757
BK black
BN brown
BU blue

Ⓔ Plug to the burner

External burner start – base load

Contact at terminals "1" and "2" of plug 143

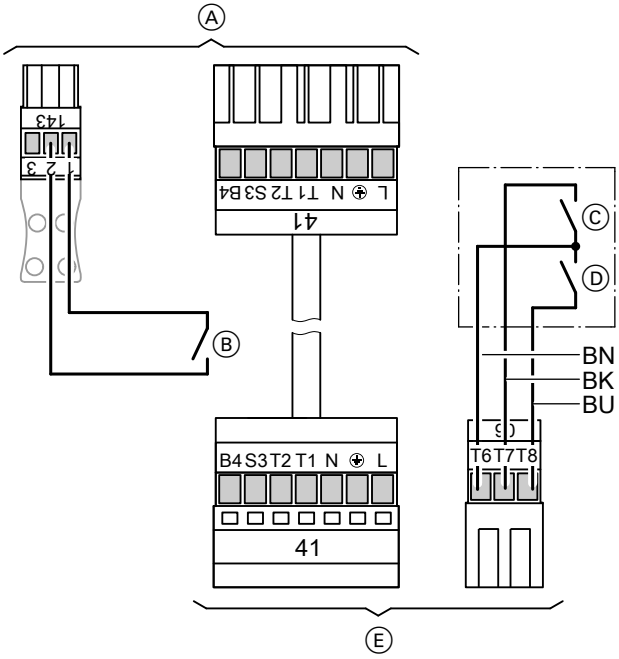
- Contact closed:
  The burner is started with base load. To maintain the minimum temperature, the burner is switched to full load via the Vitotronic 100.
  The boiler water temperature is limited by the electronic maximum temperature limiter, if that is set below that of mechanical temperature controller.
- Contact open:
  The burner is switched OFF.

Vitocrossal with modulating burner (on-site modulation controller)

Burner connection:

- Connect plug 41 of Vitotronic 100 to the burner.
- Plug 90 of the Vitotronic 100 remains unallocated.
- Connect plug 90 of the burner to the on-site modulation controller.

Single boiler system – connecting an… (cont.)



Ⓐ Plug to the control unit
Ⓑ Burner with base load "ON"
Ⓒ Reduce burner output (modulation controller)
Ⓓ Increase burner output (modulation controller)
Ⓔ Plug to the burner

Colour coding to DIN IEC 60757
BK black
BN brown
BU blue

External burner start – base load

Contact at terminals "1" and "2" of plug 143

- Contact closed:
  The burner is started with base load. An external modulation controller regulates the load-dependent modulation.

Single boiler system – connecting an… (cont.)

The boiler water temperature is limited by the electronic maximum temperature limiter, if that is set below that of mechanical temperature controller ⏱.

- Contact open:
  The burner is switched OFF.

Multi boiler system – connecting an external control unit

Settings

- Codes in category 2 **"Boiler"**:
  – "02:1" for two-stage burner
  – "02:2" for modulating burner
  – "01:3" for multi boiler system with on-site cascade control (third party control unit)
  – "01:2" with on-site cascade control (third party control unit) via LON
- The cascade and cylinder control must be provided by the higher third party control unit.

> **!** **Please note**
> A boiler enable contact is essential to prevent boiler damage.
> This contact **must** always be closed on the lead boiler.

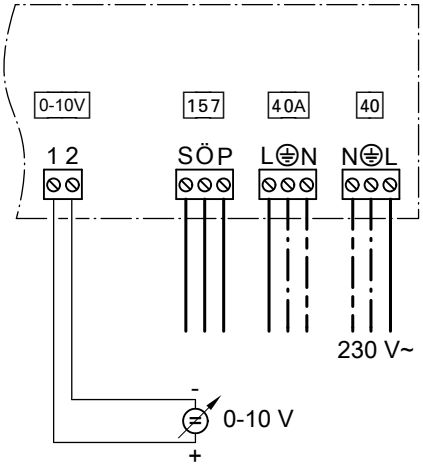
- The high limit safety cut-out settings and other settings depend on the system equipment level along with safety equipment to EN 12828 or EN 12953.

High limit safety cut-out	110 °C	100 °C
Temperature controller	100 °C	87 °C
Electronic maximum boiler water temperature limit, coding address "06" in group 2 **"Boiler"** at the Vitotronic 100	95 °C	85 °C
Maximum temperature of the on-site control unit	90 °C	80 °C

Multi boiler system – connecting an… (cont.)

External demand via 0 – 10 V input

Connection at 0 – 10 V input at **extension EA1** on **each** Vitotronic 100 (accessory, see page 173).



Enable boiler without an additional enable contact

0 to 1 V
- Boiler blocked.
- Butterfly valve closed.
- Boiler circuit pump or shunt pump OFF.

1 to 10 V
- Boiler water temperature default
  1 V ≙ Set value 10 °C
  10 V ≙ Set value 100 °C
  Observe coding address "1E" in the **"General"** category.
- Boiler enabled and held at its minimum temperature.
- Butterfly valve open.
- Boiler circuit pump or shunt pump enabled.

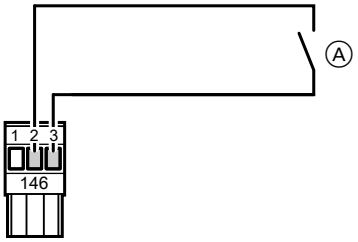
Note
Only for low temperature boilers:
On the lead boiler, the voltage must be ***higher than 1 V****.*

Enable boiler with an additional enable contact

0 - 1 V ≙ "No default set boiler water temperature"
1 V ≙ Set value 10 °C
10 V ≙ Set value 100 °C

Observe coding address "1E" in the **"General"** category.

Multi boiler system – connecting an… (cont.)



Ⓐ Boiler enable
(floating contact)

Make connection at plug 146.

Note
*This contact must **always** be closed on the lead boiler.*

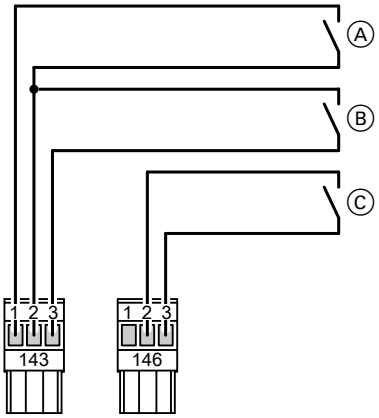
Contact	Closed	Open
Ⓐ	Boiler enabled and held at its minimum temperature. The butterfly valve opens.	The butterfly valve is closed after approx. 5 min. External burner start not possible.

External demand via switching contacts

Connection at plug 143/146 of the control unit.
The set boiler water temperature is adjusted via code "9b" in category 1**"General"**.

Two-stage burner

Ⓐ, Ⓑ and Ⓒ are floating contacts of the higher control unit.



Ⓐ Burner stage 1 "ON"
Ⓑ Burner stage 2 "ON"
Ⓒ Boiler enable
Butterfly valve "Open" or "Close"

Multi boiler system – connecting an… (cont.)

External burner start – burner stage 1

Contact at terminals "1" and "2" of plug 143:

- Contact closed:
  Burner stage 1 is switched on.
  Burner stage 2 is switched ON only for maintaining the minimum temperature.
  The boiler water temperature is limited by the electronic maximum temperature limiter, if that is set below that of mechanical temperature controller ⏲.
- Contact open:
  Burner stage 1 is switched off.

External burner start – burner stage 1 and 2

Contact at terminals "2" and "3" of plug 143

- Contact closed:
  Both burner stages are switched ON.
  The boiler water temperature is limited by the electronic maximum temperature limiter, if it is set below that of mechanical control thermostat "⏲".
  Burner stage 2 is switched OFF 2 K sooner.
- Contact open:
  Burner stages 1 and 2 are switched OFF.

Enable boiler, butterfly valve

Contact at terminals "2" and "3" of plug 146

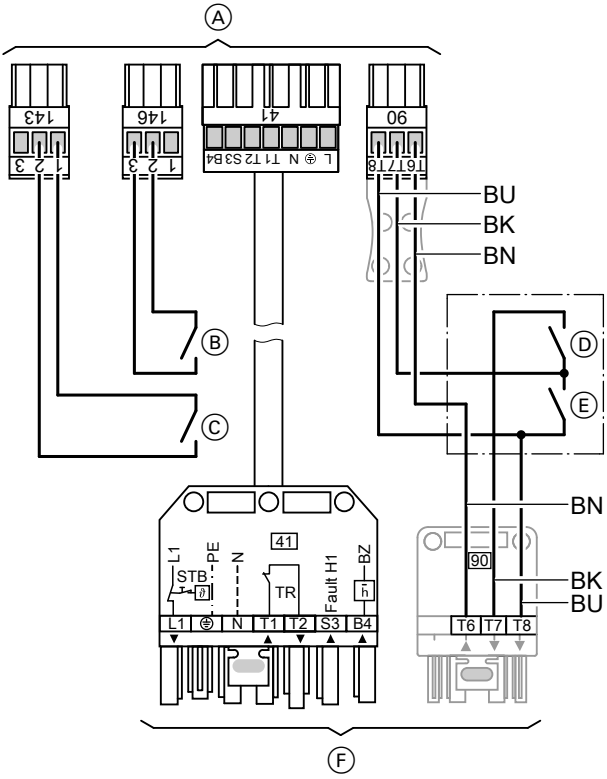
- Contact closed:
  – Vitocrossal:
  The butterfly valve opens.
  – Low temperature boiler:
  Initially, the preheat function for lag boilers is activated.
  After the preheat function has expired, the minimum boiler water temperature will be maintained and the burner stages can be controlled externally.
  The butterfly valve opens.
- Contact open:
  The butterfly valve is closed after approx. 5 min.
  Burner stages cannot be switched ON externally; a minimum temperature will not be maintained.

Multi boiler system – connecting an… (cont.)

Low temperature boiler with modulating burner (on-site modulation controller)

Burner connection:

- Connect plug [41] of Vitotronic 100 to the burner.
- Plug [90] from the Vitotronic 100 via modulation controller (on site) to plug [90] on the burner.
- Via external demand [143], the on-site modulation controller starts the burner with base load.



Ⓐ Plug to the control unit

Ⓑ Boiler enable
Butterfly valve "Open" or "Close"

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Multi boiler system – connecting an… (cont.)

Ⓒ Burner with base load "ON"
Ⓓ Reduce burner output (modulation controller)

Colour coding to DIN IEC 60757
BK black
BN brown
BU blue

External burner start – base load

Contact at terminals "1" and "2" of plug 143

- Contact closed:
  The burner is started with base load. To maintain the minimum temperature, the burner is switched to full load via the Vitotronic 100.
  The boiler water temperature is limited by the electronic maximum temperature limiter, if that is set below that of mechanical temperature controller ⓣ.
- Contact open:
  The burner is switched OFF.

Ⓔ Increase burner output (modulation controller)
Ⓕ Plug to the burner

Enable boiler, butterfly valve

Contact at terminals "2" and "3" of plug 146

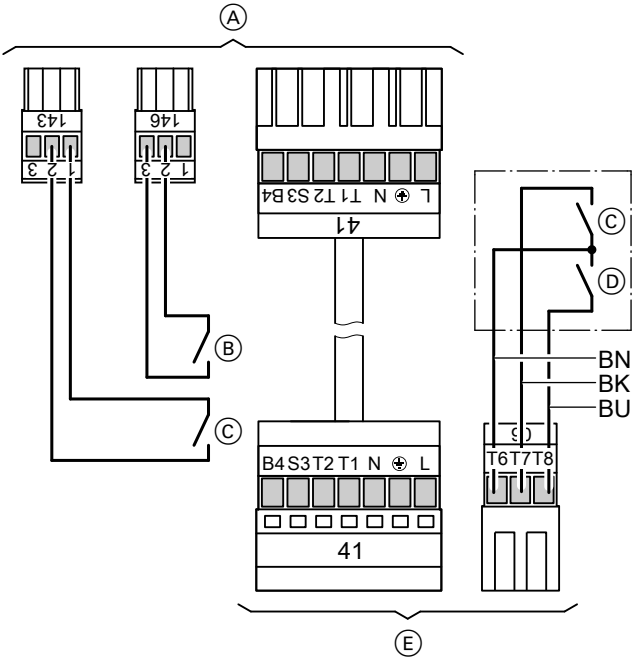
- Contact closed:
  Initially, the preheat function for lag boilers is activated.
  After the preheat function has expired, the minimum boiler water temperature is maintained and the burner is controlled by the on-site modulation controller.
- Contact open:
  The butterfly valve is closed after approx. 5 min.
  The burner cannot be switched ON externally; a minimum temperature will not be maintained.

Vitocrossal with modulating burner (on-site modulation controller)

Burner connection:

- Connect plug 41 of Vitotronic 100 to the burner.
- Plug 90 of the Vitotronic 100 remains unallocated.
- Via external demand 146, the on-site modulation controller starts the burner with base load.

Multi boiler system – connecting an… (cont.)



Ⓐ Plug to the control unit
Ⓑ Boiler enable
Butterfly valve "Open" or "Close"
Ⓒ Burner with base load "ON"
Ⓓ Reduce burner output (modulation controller)
Ⓔ Increase burner output (modulation controller)
Ⓕ Plug to the burner

Colour coding to DIN IEC 60757
BK black
BN brown
BU blue

External burner start – base load

Contact at terminals "1" and "2" of plug 143

■ Contact closed:
The burner is started with base load. An external modulation controller regulates the load-dependent modulation.

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Multi boiler system – connecting an… (cont.)

The boiler water temperature is limited by the electronic maximum temperature limiter, if that is set below that of mechanical temperature controller ⏱.

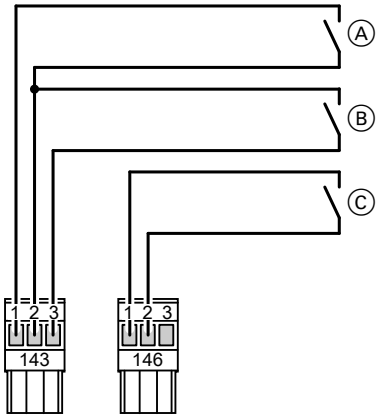
- Contact open:
  The burner is switched OFF.

Enable boiler, butterfly valve

Contact at terminals "2" and "3" of plug 146

- Contact closed:
  The butterfly valve opens.
- Contact open:
  The butterfly valve is closed after approx. 5 min.
  The burner cannot be switched ON externally; a minimum temperature will not be maintained.

Hooking up on-site control devices via LON



Ⓐ Boiler blocking
Ⓑ Start boiler as the last one in the boiler sequence
Ⓒ External changeover of stepped/ modulating burners

Boiler blocking

Contact at terminals "1" and "2" of plug 143:

- Contact closed:
  The boiler is blocked and has been removed from the boiler sequence.
  The butterfly valve or the 3-way mixer for constant return temperature raising, the shunt pump or the boiler circuit pump are switched OFF.
  The other boilers provide the required heating.

> **!** **Please note**
> If all boilers are blocked or there is no other boiler ready for operation,
> then there will be **no** frost protection for the heating system.

- Contact open:
  The boiler is reinstated into the current boiler sequence.

Multi boiler system – connecting an… (cont.)

Start boiler as the last one in the boiler sequence

Contact at terminals "2" and "3" of plug 143:

- Contact closed:
  The boiler is started as the last one in the boiler sequence.
  This boiler is started if the other boilers in the heating system cannot provide sufficient heat.
- Contact open:
  The boiler is reinstated into the current boiler sequence.

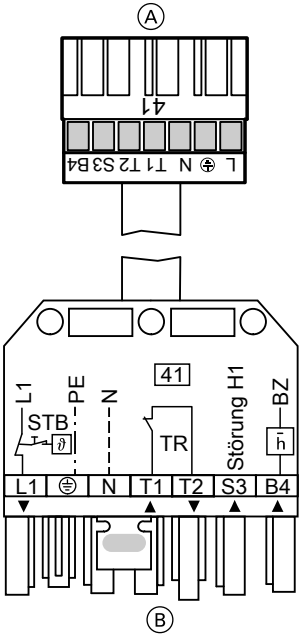
Connecting an AC burner

Pressure-jet oil/gas burners

The burner cables are included in the standard boiler delivery.
Connect the burner in accordance with **DIN 4791** [or local regulations].

Max. current consumption 6 (3) A.

Connecting an AC burner (cont.)



Ⓐ To the control unit
Ⓑ To the burner

Burner without plug
Install the mating plug from Viessmann or from the burner manufacturer; connect the burner cable.

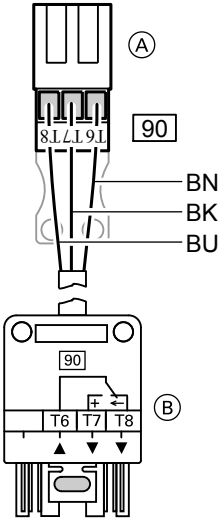
Terminal codes

L1	Phase via high limit safety cut-out to the burner
PE	Earth conductor to burner
N	Neutral conductor to burner
T1, T2	Control chain
S3	Connection for burner fault
B4	Connection for hours run meter
▼	Signal pass direction: Control unit → burner
▲	Signal pass direction: Burner → control unit

Equipment codes

High limit safety cut-out	Control unit high limit safety cut-out
TR	Control unit temperature controller
H1	Burner fault signal
BZ	Hours run meter

Connecting an AC burner (cont.)



Terminal codes
T6, T8 Control chain burner stage 2
"ON" or modulation controller "OPEN"
T6, T7 Control chain burner stage 2
"OFF" or modulation controller "CLOSE"
▼ Signal pass direction:
Control unit → burner
▲ Signal pass direction:
Burner → control unit

Colour coding to DIN IEC 60757
BK black
BN brown
BU blue

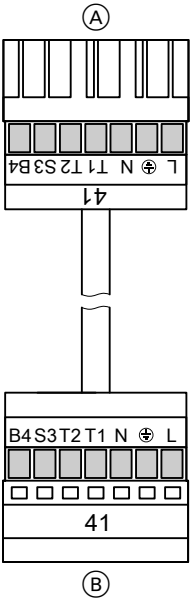
Ⓐ To the control unit
Ⓑ To the burner

Viessmann Unit burner

The burner cables are included in the Vitocrossal standard delivery.

Max. current consumption 6 (3) A.

Connecting an AC burner (cont.)

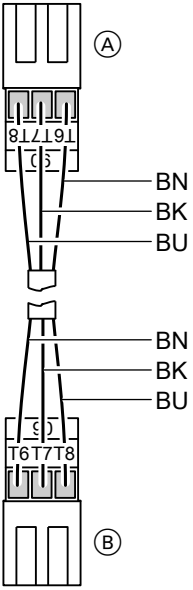


Terminal codes

L1	Phase via high limit safety cut-out to the burner
PE	Earth conductor to burner
N	Neutral conductor to burner
T1, T2	Control chain
S3	Connection for burner fault
B4	Connection for hours run meter
▼	Signal pass direction: Control unit → burner
▲	Signal pass direction: Burner → control unit

Ⓐ To the control unit
Ⓑ To the burner

Connecting an AC burner (cont.)



Ⓐ To the control unit
Ⓑ To the burner

Terminal codes
T6, T8 Control chain burner stage 2 "ON" or modulation controller "OPEN"
T6, T7 Control chain burner stage 2 "OFF" or modulation controller "CLOSE"

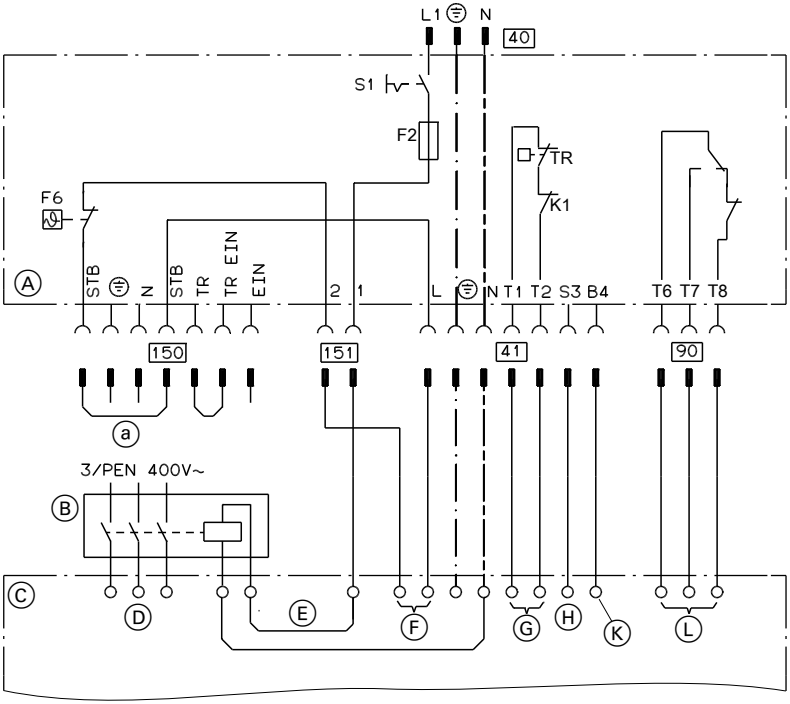
Colour coding to DIN IEC 60757
BK black
BN brown
BU blue

Connecting a three-phase burner

Safety chain, potential free

Note
If there is a jumper from the external conductor to the control voltage in the burner, it may have to be removed.
Always observe *the burner manufacturer's details.*

Connecting a three-phase burner (cont.)



- (A) Control unit
- (B) Main contactor (on site)
- (C) Three-phase burner
- (D) Three-phase burner power supply
- (E) Main contactor control
- (F) Safety chain (high limit safety cut-out), potential-free
- (G) Control chain stage 1/base load
- (H) Burner fault message
- (K) Hours run meter stage 1
- (L) Base load/full load

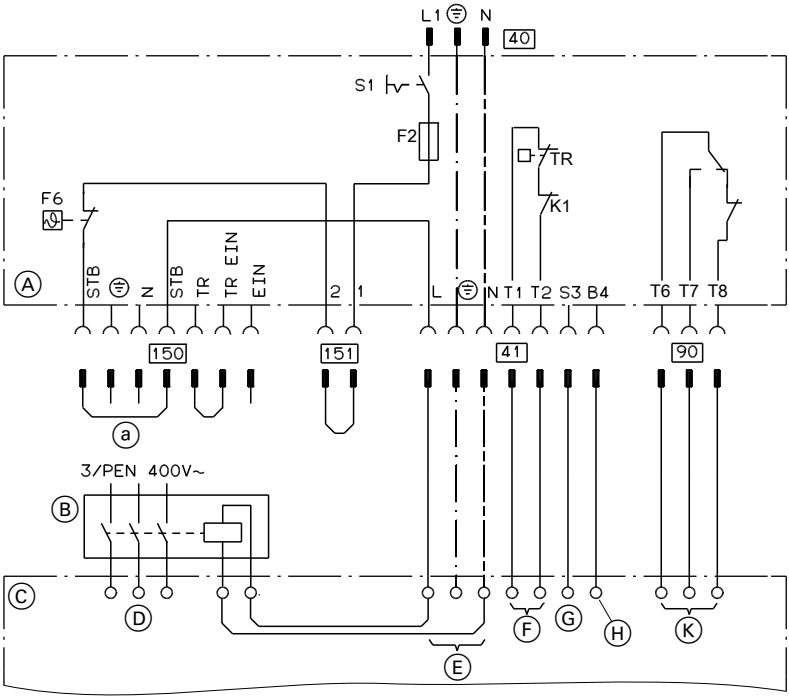
- [40] Control unit power supply connection
- [41] Burner, stage 1
- [90] Burner, stage 2
- [150] Plug for external connections
  - (a) External safety equipment; remove jumper when connecting
- [151] Safety chain, potential-free, remove jumper when making this connection

Connecting a three-phase burner (cont.)

Safety chain not potential-free

Note
If there is a jumper from the external conductor to the control voltage in the burner, it may have to be removed.

***Always observe** the burner manufacturer's details.*



- Ⓐ Control unit
- Ⓑ Main contactor (on site)
- Ⓒ Three-phase burner
- Ⓓ Three-phase burner power supply
- Ⓔ Main contactor control
- Ⓕ Control chain stage 1/base load
- Ⓖ Burner fault message
- Ⓗ Hours run meter stage 1
- Ⓚ Base load/full load

- [40] Control unit power supply connection
- [41] Burner, stage 1
- [90] Burner, stage 2
- [150] Plug for external connections
  - ⓐ External safety equipment; remove jumper when connecting
- [151] Safety chain (STB)

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Power supply

Directives

Regulations

Carry out the power supply connection and all earthing measures (i.e. RCD circuit) in accordance with IEC 60364, the requirements of your local power supply utility, and VDE or national regulations. Protect the power cable to the control unit with an appropriate fuse/MCB.

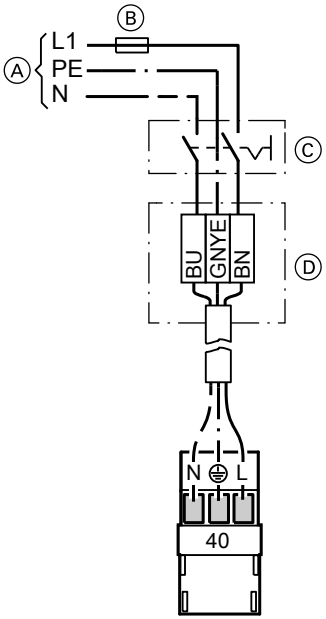
For oil and gas combustion equipment over 100 kW, according to the Sample Combustion Ordinance "FeuVO", an "emergency shutdown" must be installed on site outside the installation room. The national combustion equipment ordinance for your local region must be observed. For combustion equipment to EN 50156-1, the "emergency shutdown" installed on site must comply with the requirements of EN 50156-1.

Install the "emergency shutdown" outside the installation room; it must be able to separate **all** non-earthed conductors simultaneously with a gap of 3 mm at least.
We additionally recommend installing an AC/DC-sensitive RCD (RCD class B) for DC (fault) currents that can occur with energy-efficient equipment.

Recommended power cable

3-core cable selected from the following options:
- H05VV-F3G 1.5 mm^2
- H05RN-F3G 1.5 mm^2

Power supply (cont.)



Ⓐ Power supply 230 V~
Ⓑ Fuse
Ⓒ Mains isolator, two-pole (on-site)
Ⓓ Junction box (on site)

1. Check whether the power cable to the control unit has appropriate fuse protection.
2. Connect the power cable at the junction box and plug [40] (on-site).

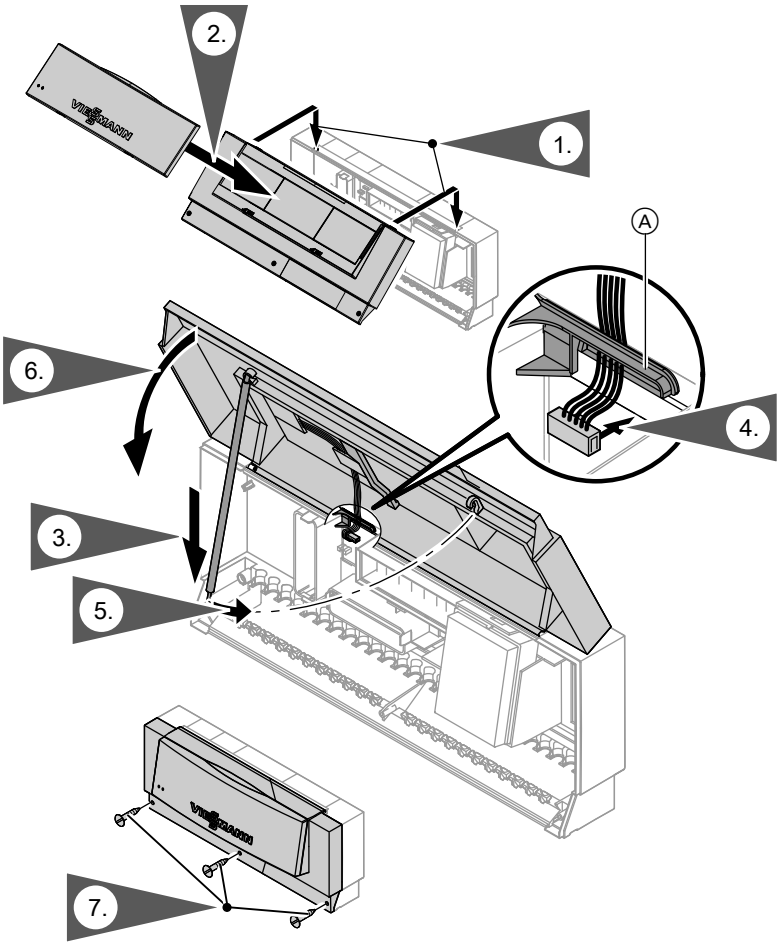
Danger
Incorrect core allocation can cause severe injury and can damage the appliance.
Take care not to interchange wires "L1" and "N":
L1 BN (brown)
N BU (blue)
PE GNYE (green/yellow)

3. Insert plug [40] into the control unit.

Power supply in conjunction with Vitocrossal, type CT2

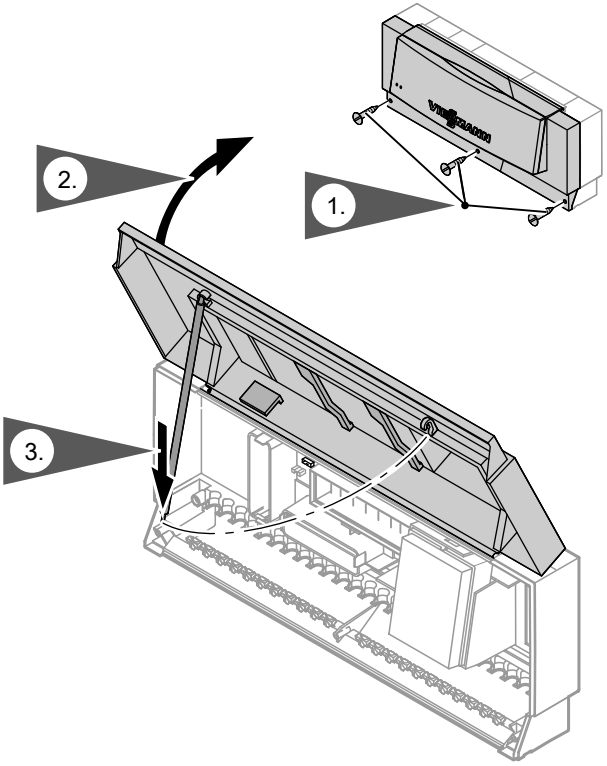
The power supply is connected at the boiler burner control unit.

Fitting the front part of the control unit



Ⓐ Cable locking tab

Opening the control unit



Testing the high limit safety cut-out

The minimum circulation volume should be 10 % of the circulation volume at rated load.
Reduce the heat consumption as far as possible.

1. Hold down the "TEST" key until the burner has shut down:
   Thermostat is bridged. The high limit safety cut-out must shut down the burner at the latest when the safety temperature has been reached.
2. Release the "TEST" key.
3. Wait until the boiler water temperature has dropped approx. 15 to 20 K below the selected safety temperature.
4. Reset the high limit safety cut-out by pressing reset button.

Operating instructions

Matching the coding addresses to the system version

Check and poss. adjust all addresses in **Code 1**.

Check the following coding addresses and adjust accordingly in **Code 2**:

	Category	Function
"0C"	2 **"Boiler"**	Return temperature control
"0d"	2 **"Boiler"**	Therm-Control
"4C"	1 **"General"**	Function plug 20
"4d"	1 **"General"**	Function plug 29
"4E"	1 **"General"**	Function plug 52
"98"	1 **"General"**	Viessmann system number
"9C"	1 **"General"**	Monitoring LON subscribers

Matching the coding addresses to the system… (cont.)

Matching the control unit to the two-stage burner

Matching coding addresses according to the burner used

Address	Meaning	Setting
03:...	Fuel	Gas operation: 0 (delivered condition) Oil operation: 1 (irreversible)
08:...	Units and tens of the maximum burner output	Example: Max. burner output: 225 kW – select: 25 ***Note*** *Values up to and including 199 kW can be entered directly.*
09:...	Hundreds of the maximum burner output	Example: Max. burner output: 225 kW – select: 2
0A:...	Ratio of output burner stage 1 to maximum burner output in percent	Example: Output burner stage 1 135 kW Max. burner output: 225 kW (135 kW: 225 kW) • 100 % = 60 %

Matching the control unit to the modulating burner

Note
The burner must be fully adjusted. To achieve a wide modulating range, set the minimum output as low as possible (take the chimney and flue system into account).

Matching coding addresses according to the burner used

Address	Meaning	Setting
03:...	Fuel	Gas operation: 0 (delivered condition) Oil operation: 1 (irreversible)
08:...	Units and tens of the maximum burner output	Example: Max. burner output: 225 kW – select: 25 ***Note*** *Values up to and including 199 kW can be entered directly.*

Matching the coding addresses to the system… (cont.)

Address	Meaning	Setting
09:...	Hundreds of the maximum burner output	Example: Max. burner output: 225 kW – select: 2
15:...	Modulation range runtime	Calculate servomotor runtime (s) between base load and max. burner output
0A:...	Ratio of output base load to maximum burner output in percent	Example: Output burner stage 1 135 kW Max. burner output: 225 kW (135 kW: 225 kW) • 100 % = 60 %
05:...	Ratio of partial output at ⅓ of the servomotor runtime to maximum burner output in percent	Example: Partial output 171 kW Max. burner output: 225 kW (171 kW: 225 kW) • 100 % = 76 %

Checking actuators and sensors

Testing relays

1. Press **OK** and ☰ simultaneously for approx. 4 s.
   🔧 flashes on the display.
2. With ▶ select ⇄ and confirm with **OK**.
3. Select required actuator with ▲/▼ (see following table).
   The display shows the number for the activated actuator and **"ON"**.

Checking actuators and sensors (cont.)

The following actuators (relay outputs) can be switched subject to system equipment level:

Display	Explanation
0	All actuators are switched off
1	Burner ON or burner stage 1 ON or modulation controller ramps up (modul. burner)
2	Burner stages 1 and 2 ON or modulation controller neutral (modul. burner)
3	Modulation controller ramps down (modul. burner).
5	Output [20] On
6	Output [29] On
7	Output [52] Open
8	Output [52] Neutral
9	Output [52] Close
10	Output circulation pump for cylinder heating [21] ON
11	Output central fault message [50] ON
15	Solar circuit pump output [24] at solar control module SM1 enabled
16	Solar circuit pump output [24] at solar control module SM1 switched to minimum speed
17	Solar circuit pump output [24] at solar control module SM1 switched to maximum speed
18	Output [22] at solar control module SM1 enabled
19	Contact P - S on plug [157] for extension EA1 closed
20	Output A1 at extension AM1 enabled
21	Output A2 at extension AM1 enabled

Note
During burner operation, the connected pumps are started.

Checking sensors

Actual temperatures can be scanned in the **"i"** menu.

Operating instructions

Integrating a control unit into the LON

The LON communication module (accessories) must be plugged in (see parts list).

Note
The data transfer via LON can take several minutes.

Integrating a control unit into the LON (cont.)

Multi boiler system with Vitotronic 100 and Vitocom 300

Set the LON subscriber numbers and further functions via code 2.

Note
In the same LON system, the same number cannot be allocated twice.
***Only one Vitotronic** may be programmed as fault manager.*

Carrying out a LON subscriber check

Communication with the LON subscribers connected to the fault manager is tested by means of a subscriber check.

Requirements:
- The control unit must be programmed as **fault manager** (code "79:1").
- The LON subscriber number must be programmed in all control units.
- The LON subscriber list in the fault manager must be up to date.

1. Press **OK** and ☰ simultaneously for approx. 4 s.
2. Press ▶ to select ⑦.
   A list of the known LON subscribers is displayed.
   Example: **01 - - 99**
3. Select subscriber with ▲/▼.
4. Activate the check with **OK**.
   The subscriber address flashes.
   - Check OK: subscriber address is shown constantly.
   - Check not OK: ⚠ also appears.

   Successfully tested subscribers are indicated in the list with ":"
5. Exiting the subscriber check: Press ⮌.

Entering a service PIN for LON subscribers

Integration of the Vitotronic 100 into a higher LON system, e.g. in conjunction with a third party control unit.
The LON subscriber is identified with the service PIN.

1. Press **OK** and ☰ simultaneously for approx. 4 s.
2. Press ▶ to select ⑥.
   "PIN" is displayed.
3. Enable PIN with **OK**.
4. Exiting the input function: Press ⮌.

Entering a PIN code for Vitocom 100

The PIN code of a connected Vitocom 100 can be entered at the Vitotronic 100.

Vitocom 100 installation instructions

1. Press **OK** and ☰ simultaneously for approx. 4 s.
2. Press ▶ to select ⑧.
   "00 00" is displayed for the entry of the PIN code and the number of remaining entry attempts.
3. Select the position for the entry with ▶/◀.
4. Select the relevant figures with ▲/▼.
5. Confirm the PIN code with **OK**.
   The entered PIN code is checked (figures flashing).
   If the PIN code entered is correct, **"FrEE"** is displayed and the entry is automatically left.
6. Exiting the input function: Press ⮌.

Calling up the service level

1. Press **OK** and ☰ simultaneously for approx. 4 s.
   🔧 flashes on the display.
2. Select required function. See the following pages.

Leaving the service level

1. Press ▶ to select ⑨.
2. Confirm with **OK**.
   "OFF" flashes.
3. Confirm with **OK**.

   Note
   The service level is automatically exited after 30 minutes.

Scanning operating data

Operating data can be scanned in the **"i"** menu.

Operating instructions

Brief scan

1. Press **OK** and ☰ simultaneously for approx. 4 s.
   🔧 flashes on the display.
2. Confirm with **OK**.
3. Select the required scan with ▲/▼. For example, "b" for "Boiler coding card" (see following table):
4. Confirm selected scan with **OK**.

For explanations of individual scans, see the following table:

Brief scan	Display				
0					
0		System scheme	Software version Control unit		Software version Programming unit
2			Maximum flue gas temperature		
3			Set boiler water temperature		
4			Common demand temperature		
5			Set cylinder temperature		

Brief scan (cont.)

Brief scan	Display				
0	0	0	0	0	0
6		Number of KM BUS subscribers		Number of LON subscribers	
7	SNVT configuration 0:Auto 1:Tool	Software version communication coprocessor		Software version LON module	
8		Subnet address/system no.		Node address	
9		Burner type		Appliance type	
b		Boiler coding card			
L	Burner: 0: OFF 1: Burner stage 1/ base load 2: Burner stage 2/full load	Butterfly valve: 0: OFF 1: Preheating 2: Control Close 3: Control 4: Control Open 5: Open 6: Run-on	Output reduction in % 0: OFF		
E ①	Software version solar control module, type SM1				Software version cascade module
E ③				Software version plug-in adaptor for external safety equipment	
	Extension AM1				
F ②	Software version	Output A1 configuration (value corresponds to code 33 setting)	Output A1 switching state 0: OFF 1: ON	Output A2 configuration (value corresponds to code 34 setting)	Output A2 switching state 0: OFF 1: ON

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Brief scan (cont.)

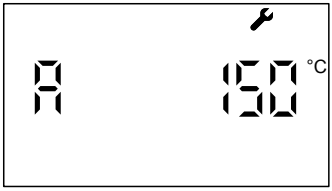
Brief scan	Display				
0	0	0	0	0	0
	Extension EA1				
F ③	Output 157 configuration (value corresponds to code 5C setting)	Output 157 switching state 0: OFF 1: ON	Input DE1 switching state 0: open 1: closed	Input DE2 switching state 0: open 1: closed	Input DE3 switching state 0: open 1: closed
F ④	Software version		External hook-up 0 - 10 V Display in %		
	Solar control module SM1				
F ⑤	Stagnation time of the solar thermal system in h				
F ⑥	Night DHW circulation, solar thermal system (number)				
F ⑦	Monitoring of differential temperature, solar thermal system				
F ⑧				Reheating suppression 0: disabled 1: enabled	Output 22 switching state 0: OFF 1: ON

Scanning and resetting service display

When the limits specified in coding addresses "21", "23" or "1F" in category 2 **"Boiler"** are reached, the red fault indicator flashes and the following appears on the programming unit display (subject to the setting):

- The specified hours run and 🔧.
- The defaulted interval with clock symbol 🕒 and 🔧.
- The defaulted max. flue gas temperature and 🔧.

Scanning and resetting service display (cont.)



Acknowledging and resetting service

Press **OK** to acknowledge a service message.

Note
An acknowledged service message that was not reset reappears after 7 days.

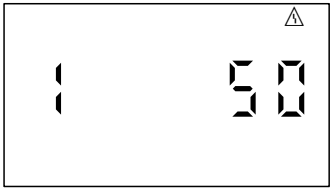
After a service has been carried out (resetting service)

Reset code "24:1" to "24:0" in category 2 **"Boiler"**.

Note
The selected service parameters for hours run and time interval restart at 0.

Fault display

In the event of a fault, the red fault display flashes at the control unit. On the programming unit display, the 2-digit fault code and ⚠ flash.
Output 50 (central fault message) is switched ON.
Other current faults can be displayed with ▲/▼. For an explanation of the fault codes, see the following pages.



Example: Fault code "50"

Acknowledge fault

Press **OK**; the standard display is shown again.
A fault message facility, if connected, will be switched off.

If an acknowledged fault is not remedied, the fault message will be re-displayed the following day and the fault message facility restarted.

Calling up acknowledged faults

Press **OK** for approx. 4 s.

The 10 most recent faults (including resolved ones) can be scanned.

Calling up fault codes from the fault memory (fault history)

The 10 most recent faults (including those remedied) are saved and can be called up.
Faults are sorted by date.

1. Press **OK** and ☰ simultaneously for approx. 4 s.
2. Select ⚠ with ▶ and activate fault history with **OK**.
3. Select fault messages with ▲/▼.

Fault display (cont.)

Fault codes

Displayed fault code	System characteristics	Cause	Measures
0F	Control mode.	Service "0F" is only displayed in the fault history.	Service required ***Note*** *After servicing, set code "24:0".*
30	■ With DHW cylinder: Circulation pump for cylinder heating on; boiler is maintained at set cylinder temperature. ■ Without DHW cylinder: Boiler is regulated by the temperature controller.	Short circuit, boiler water temperature sensor.	Check the boiler water temperature sensor (see page 169).
38	■ With DHW cylinder: Circulation pump for cylinder heating on; boiler is maintained at set cylinder temperature. ■ Without DHW cylinder: Boiler is regulated by the temperature controller.	Lead break, boiler water temperature sensor.	Check the boiler water temperature sensor (see page 169).

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
50	Cylinder primary pump "ON": Set DHW temperature = Set boiler water temperature Priority control is cancelled or With primary store system: Cylinder heating is started and stopped via cylinder temperature sensor 2.	Short circuit, cylinder temperature sensor 1.	Check the cylinder temperature sensor (see page 169).
51	With primary store system: Cylinder heating is started and stopped via cylinder temperature sensor 1.	Short circuit, cylinder temperature sensor 2.	Check the cylinder temperature sensor (see page 169).
52	Control mode.	Short circuit, flow temperature sensor.	Check the flow temperature sensor (see page 169).
58	Cylinder primary pump "ON": Set DHW temperature = Set boiler water temperature Priority control is cancelled or With primary store system: Cylinder heating is started and stopped via cylinder temperature sensor 2.	Lead break, cylinder temperature sensor 1.	Check the cylinder temperature sensor (see page 169).

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
59	With primary store system: Cylinder heating is started and stopped by cylinder temperature sensor 1.	Lead break, cylinder temperature sensor 2.	Check the cylinder temperature sensor (see page 169).
5A	Control mode.	Lead break, flow temperature sensor.	Check the flow temperature sensor (see page 169).
60	Boiler with maximum temperature, no output reduction, mixing valve return temperature control "Open".	Short circuit, temperature sensor 17A.	Check temperature sensor (see page 169).
68	Boiler with maximum temperature, no output reduction, mixing valve return temperature control "Open".	Lead break, temperature sensor 17A.	Check temperature sensor (see page 169). Without temperature sensor: Set code "4A:0" in group 1 **"General"**.
70	Shunt pump constantly "ON". With primary store system: Mixer primary circuit "Close"; no DHW heating.	Short circuit, temperature sensor 17B.	Check temperature sensor (see page 169).
78	Shunt pump constantly "ON". With primary store system: Mixer primary circuit "Close"; no DHW heating.	Lead break, temperature sensor 17B.	Check temperature sensor (see page 169). Without temperature sensor: Set code "4b:0" in group 1 **"General"**.

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
90	Control mode.	Short circuit, temperature sensor [7], Connection at the solar control module.	Check temperature sensor [7]. Solar control module installation and service instructions
91	Control mode.	Short circuit, temperature sensor [10], Connection at the solar control module.	Check temperature sensor [10]. Solar control module installation and service instructions
92	No solar DHW heating.	Short circuit, collector temperature sensor, Connection of temperature sensor [6] at solar control module or sensor at S1 of the Vitosolic.	Check solar control unit sensor. Solar control unit installation and service instructions
93	Control mode.	Short circuit, temperature sensor, connection at S3 of the Vitosolic.	Check solar control unit sensor. Solar control unit installation and service instructions

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
94	No solar DHW heating.	Short circuit, cylinder temperature sensor, connection of temperature sensor [5] at solar control module or sensor at S2 of the Vitosolic.	Check solar control unit sensor. Solar control unit installation and service instructions
98	Control mode.	Lead break, temperature sensor [7], connection to the solar control module.	Check temperature sensor [7]. Solar control module installation and service instructions
99	Control mode.	Lead break, temperature sensor [10], connection to the solar control module.	Check temperature sensor [10]. Solar control module installation and service instructions
9A	No solar DHW heating.	Lead break, collector temperature sensor, connection of temperature sensor [6] at solar control module or sensor at S1 of the Vitosolic.	Check solar control unit sensor. Solar control unit installation and service instructions
9b	No solar DHW heating.	Lead break, temperature sensor, connection of sensor at S3 of the Vitosolic.	Check solar control unit sensor. Solar control unit installation and service instructions

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
9C	Control mode.	Lead break, cylinder temperature sensor, connection of temperature sensor [5] at solar control module or sensor at S2 of the Vitosolic.	Check solar control unit sensor. Solar control unit installation and service instructions
9E	Control mode.	No flow rate in solar circuit or flow rate too low, or temperature limiter has responded.	Check solar circuit pump and solar circuit. Acknowledge fault message. Solar control unit installation and service instructions
9F	Control mode.	Solar control module or Vitosolic fault. Displayed if a fault occurs at these appliances that has no fault code in the Vitotronic.	Check solar control unit. Solar control unit installation and service instructions
A0	Boiler cools down.	Fault, safety equipment at "X7" of plug-in adaptor 2 for external safety equipment.	Check safety equipment, and reset if required.
A1	Boiler cools down.	Fault, safety equipment at "X3" of plug-in adaptor 2 for external safety equipment.	Check safety equipment, and reset if required.

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
A2	Boiler cools down.	Fault, safety equipment at "X2" of plug-in adaptor 2 for external safety equipment.	Check safety equipment, and reset if required.
A3	Boiler cools down.	Fault, safety equipment at "X1" of plug-in adaptor 2 for external safety equipment.	Check safety equipment, and reset if required.
AA	Control mode.	Therm-Control configuration fault: Plug 17A not plugged in.	Insert plug 17A. For Vitocrossal, code "0d: 0" in group 2 **"Boiler"** must be selected.
Ab	Control operation; DHW cylinder may be cold.	Primary store system configuration error: Code "55:3" has been selected, but plug 17B is not plugged in and/or Codes "4C:1" and "4E:2" in the **"General"** category have not been set.	Insert plug 17B and check codes.
AC	Control mode.	Return temperature control configuration error: Code "0C:1" in group 2 **"Boiler"** has been set, but plug 17A is not plugged in and/or code "4E:0" in group 1 **"General"** is not set.	Insert plug 17A and check codes.

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
Ad	Control mode.	Butterfly valve configuration error: Code "0C:2", "0C:3" or "0C:4" in group 2 **"Boiler"** is set and code "4E:1" in group 1 **"General"** is set.	With butterfly valve: Set code "4E:0" in group 1 **"General"**. Without butterfly valve: Set code "0C:1" in group 2 **"Boiler"**.
b0	Control mode.	Short circuit, flue gas temperature sensor.	Check the flue gas temperature sensor (see page 170).
b1	Control mode.	Communication error, programming unit.	Check connections and replace the programming unit if required.
b5	Control mode.	Internal fault.	Check PCB and plug-in connection; replace PCB if required.
b6	Constant mode.	Invalid hardware recognised.	Check coding address "92"; "92:161" must be selected.
b7	Boiler is regulated by the temperature controller.	Boiler coding card fault.	Plug in or replace boiler coding card.
b8	Control mode.	Lead break, flue gas temperature sensor.	Check the flue gas temperature sensor (see page 170). Without flue gas temperature sensor: Set code "1F:0" in group 2 **"Boiler"**.
bF	Control mode. No communication via LON.	Incorrect LON communication module.	Replace LON communication module.
C1	Boiler cools down.	External safety equipment at plug 150.	Check connection and external safety equipment.

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
C2	No solar DHW heating.	Lead break, KM BUS to solar control module or Vitosolic.	Check KM BUS cable and appliance. Without solar control unit: Set code "54:0" in group 1 **"General"**.
C3	Control mode.	Communication error, extension AM1.	Check connections. Without extension AM1: Set code "32:0" in group 1 **"General"**.
C8	Boiler cools down.	Fault, low water indicator at "X7" of plug-in adaptor 1 for external safety equipment.	Check the system water level; reset low water indicator (see page 172).
C9	Boiler cools down.	Fault, maximum pressure limiter at "X3" of plug-in adaptor 1 for external safety equipment.	Check system pressure; reset maximum pressure limiter (see page 172).
CA	Boiler cools down.	Fault, minimum or maximum pressure limiter 2 at "X2" of plug-in adaptor 1 for external safety equipment.	Check system pressure, reset minimum or maximum pressure limiter 2 (see page 171).
Cb	Boiler cools down.	Additional high limit safety cut-out fault or temperature limiter at "X1" of plug-in adaptor 1 for external safety equipment.	Check system temperature; reset high limit safety cut-out (see page 171).

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
Cd	Control mode.	Vitocom 100 communication fault.	Check connections and the Vitocom 100. Installation and service instructions Vitocom 100 Without Vitocom 100: Set code "95:0" in group 1 **"General"**.
CE	Control mode.	Communication fault, plug-in adaptor 1 for external safety equipment.	Check plug-in adaptor (see page 171). Without plug-in adaptor: Set code "30:0" in group 1 **"General"**.
CF	Control mode. No communication via LON.	Communication error, LON communication module of control unit.	Check LON communication module and replace if required. If no LON communication module is installed, set code "76:0" in category 1 **"General"**.
d1	Boiler cools down.	Burner fault.	Check burner.
d2	Control mode.	Communication fault, plug-in adaptor 2 for external safety equipment.	Check plug-in adaptor (see page 171). Without plug-in adaptor: Set code "31:0" in group 1 **"General"**.
d3	Control mode.	Communication error, extension EA1.	Check connections (see page 173). Without extension EA1: Set code "5b:0" in category 1 **"General"**.
d4	Boiler cools down.	The high limit safety cut-out has responded or fuse F2 has blown.	Check the high limit safety cut-out or the burner, burner loop and fuse F2.
d6	Control mode.	Input DE1 at extension EA1 reports a fault.	Remove fault at appliance concerned.

Fault display (cont.)

Displayed fault code	System characteristics	Cause	Measures
d7	Control mode.	Input DE2 at extension EA1 reports a fault.	Remove fault at appliance concerned.
d8	Control mode.	Input DE3 at extension EA1 reports a fault.	Remove fault at appliance concerned.

Boiler water temperature control

Brief description

- The boiler water temperature is regulated by starting and stopping the burner or through modulation.
- The set boiler water temperature is determined from the following parameters:
  – Set flow temperature of the heating circuit A1 (system circuit) or the heating circuits connected via the LON
  – External demand
  – Set DHW temperature
- The set boiler water temperature is subject to the boiler and the heating/control versions.
  The boiler coding card defaults a minimum boiler water temperature that must be maintained to protect the boiler.
- In conjunction with Therm-Control:
  The set boiler water temperature will be increased when the actual temperature at the Therm-Control sensor falls below the set temperature.
- For heating the DHW cylinder, a set boiler water temperature is defaulted that lies 20 K above the set DHW temperature (change in coding address "60" in category 3 **"DHW"**).

Functions

The boiler water temperature is captured by the following equipment:
- High limit safety cut-out STB (liquid expansion)
- Temperature controller TR (liquid expansion)
- Boiler water temperature sensor (change in resistance)

Upper control range limits
- High limit safety cut-out STB 110/100 ºC
- Temperature controller TR 95/100 ºC
- Electronic maximum temperature limit:
  – Setting range: 20 to 127 ºC
  – Changed via coding address "06" in the **"Boiler"** category.

Lower control range limits
- In standard mode and when frost protection is enabled, the boiler water temperature will be regulated subject to the respective boiler

Boiler water temperature control (cont.)

Boiler protection function

Therm-Control

(Start-up system)
- For heating systems with distributor installed close to the boiler.
- Requirement:
  The boiler water flow rate in the start-up phase (e.g. after a weekend shut-down) must be able to be reduced by at least 50 %.
- Also affects the heating circuits.

Function

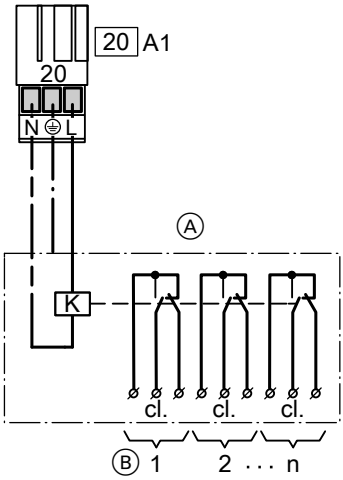
Single boiler systems
- The Therm-Control sensor, installed near the return connector, captures the return temperature.
- The burner is ramped up to full load if the factory-selected set temperature (defaulted by the boiler coding card) is not being achieved. The flow rate is reduced via the mixer.
- When the set temperature is exceeded, the mixers are opened and the flow rate gradually increased to 100 %.

Multi boiler systems
- The Therm-Control sensor, installed near the return connector, captures the return temperature.
- The burner is ramped up to full load if the factory-selected set temperature (defaulted by the boiler coding card) is not being achieved. The flow rate is reduced via the butterfly valve. Where the Therm-Control sensor cannot affect the butterfly valves it must, instead, regulate the downstream heating circuits.
- When the set temperature is exceeded, the butterfly valve is opened and the flow rate gradually increased to 100 %.

Boiler water temperature control (cont.)

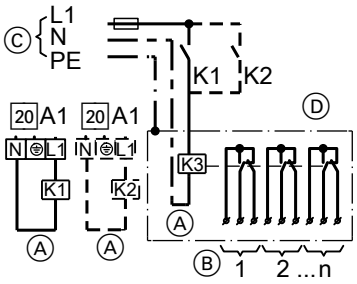
Connection in heating systems without LON

Single boiler system

- Plug 20A1 of the Vitotronic is used as switching contact for the Therm-Control.
- Required code: "**4C:2**" in category 1 **"General"**
- 

20A1 Closing the mixers
Ⓐ Contactor relay, part no. 7814 681
Ⓑ Downstream heating circuit controller, switching contact closed:
Signal for mixer "Close"

Multi boiler system

- Plug 20A1 of the Vitotronic is used as switching contact for the Therm-Control.
- Required code: "**0d:1**" in category 2 **"Boiler"** and "**4C:2**" in category 1 **"General"**
- 

20A1 Closing the mixers
Ⓐ Contactor relay, part no. 7814 681
Ⓑ Downstream heating circuit controller, switching contact closed:
Signal for mixer "Close"
Ⓒ Power supply, 230 V/50 Hz
Ⓓ Junction box, on site

Raising the return temperature via shunt pump or/and 3-way mixing valve

- With shunt pump
  For heating systems with distributor installed close to the boiler.
- With 3-way mixing valve:
  For heating systems where downstream heating circuits cannot be controlled, e.g. older heating systems or commercial nurseries.

Boiler water temperature control (cont.)

- Requirement:
  - The boiler water flow rate must be able to be reduced by at least 50 %.
  - With shunt pump:
    Size the shunt pump to approx. 30 % of the total throughput.
  - With 3-way mixing valve:
    Size the boiler circuit pump at each boiler to approx. 110 % of the total throughput.
- Also affects the heating circuits.

Function

Single boiler systems and multi boiler systems with a common shunt pump

- Temperature sensors T1 and T2 capture the return temperature at different test points.
- The shunt pump is started via temperature sensor T2 if the factory-selected minimum return temperature (defaulted by the boiler coding card) is not being achieved.
- The flow rate will be reduced via the mixer if the minimum return temperature captured by temperature sensor T1 is not achieved despite the return temperature raising.

Single boiler systems with shunt pump and 3-way mixing valve

- Temperature sensors T1 and T2 capture the return temperature at different test points.
- The shunt pump is started via temperature sensor T2 if the factory-selected minimum return temperature (defaulted by the boiler coding card) is not being achieved.
- The flow rate will be reduced via the 3-way mixing valve if, in spite of the return temperature raising facility, the minimum return temperature captured by temperature sensor T1 is not achieved.

Multi boiler systems with shunt pumps for every boiler

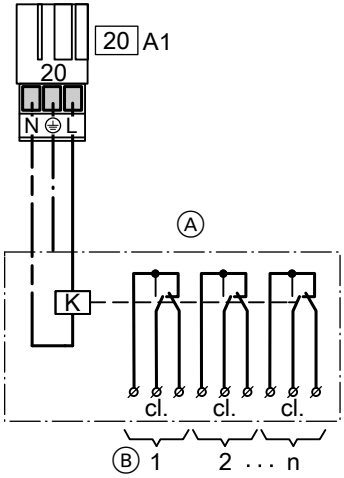
- Temperature sensors T1 and T2 capture the return temperature at different test points.
- The shunt pump is started via temperature sensor T2 if the factory-selected minimum return temperature (defaulted by the boiler coding card) is not being achieved.
- If the minimum return temperature captured by temperature sensor T1 is not achieved despite the return temperature raising, the flow rate will be reduced via the butterfly valve. Where temperature sensor T1 cannot affect the butterfly valves it must, instead, regulate the downstream heating circuits.

Boiler water temperature control (cont.)

Multi boiler systems with boiler circuit pump and 3-way mixing valve
- Temperature sensor T1 records the return temperature.
- The flow rate is proportionally reduced via the 3-way mixing valve on the boilers if the factory-selected set temperature (defaulted by the boiler coding card) is not achieved.
- When the set temperature is exceeded, the 3-way mixing valve is opened and the flow rate is gradually increased to 100 %.

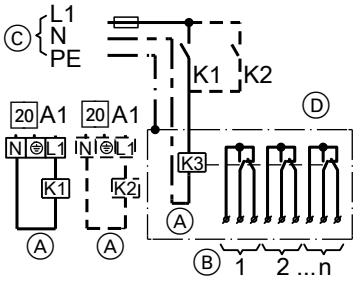
Multi boiler systems with boiler circuit pump, low loss header and 3-way mixing valve
- Temperature sensor T1 records the return temperature.
- The flow rate is proportionally reduced via the 3-way mixing valve on the boilers if the factory-selected set temperature (defaulted by the boiler coding card) is not achieved.
- When the set temperature is exceeded, the 3-way mixing valve is opened and the flow rate is gradually increased to 100 %.
- Downstream heating circuits are hydraulically separated.
- The flow temperature is controlled by the temperature sensor (cascade control unit) in the low loss header.

Connection in heating systems without LON

Single boiler system
- Plug 20 A1 of the Vitotronic is used as switching contact.
- Required code: "**4C:2**" in category 1 **"General"**
- 

20 A1 Closing the mixers
Ⓐ Contactor relay, part no. 7814 681
Ⓑ Downstream heating circuit controller, switching contact closed: Signal for mixer "Close"

Boiler water temperature control (cont.)

Multi boiler system
- Plug 20A1 of the Vitotronic is used as switching contact.
- Required code: "**0d:1**" in category 2 **"Boiler"** and "**4C:2**" in category 1 **"General"**
- 

20A1 Closing the mixers
Ⓐ Contactor relay, part no. 7814 681
Ⓑ Downstream heating circuit controller, switching contact closed: Signal for mixer "Close"
Ⓒ Power supply, 230 V/50 Hz
Ⓓ Junction box, on site

Distribution pump

- For heating systems with remote substation (> 20 m).
- Requirement: The heat transfer must be able to be reduced.
- Also affects the heating circuits.
- The distribution pump must be started by a higher third party control unit if a boiler is enabled.
- Size the distribution pump to approx. 110 % of the total throughput.
- With injection control: For heating circuits that require heat immediately a heat demand is issued (e.g. air heaters).

Function

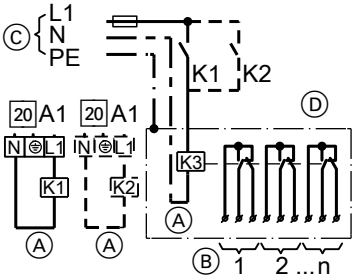
Multi boiler systems with distribution pump and low pressure distributor
- Temperature sensor T1 records the return temperature.
- The burner is ramped up to full load if the factory-selected set temperature (defaulted by the boiler coding card) is not being achieved. The flow rate is reduced via the mixer. The mixers are fully closed upon demand.
- When the set temperature is exceeded, the mixers are opened and the flow rate gradually increased to 100 %.

Multi boiler systems with distribution pump and injection control
- Temperature sensor T1 records the return temperature.
- The burner is ramped up to full load if the factory-selected set temperature (defaulted by the boiler coding card) is not being achieved. The flow rate is reduced via the mixer. For this, the mixers are proportionally or fully closed.
- When the set temperature is exceeded, the mixers are opened and the flow rate gradually increased to 100 %.

Boiler water temperature control (cont.)

Connection in heating systems without LON

Multi boiler system

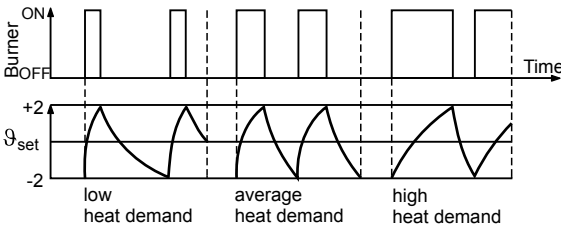
- Plug [20]A1 of the Vitotronic is used as switching contact.
- Required code: "**0d:1**" in category 2 **"Boiler"** and "**4C:2**" in category 1 **"General"**
- 

[20]A1 Closing the mixers
Ⓐ Contactor relay, part no. 7814 681
Ⓑ Downstream heating circuit controller, switching contact closed: Signal for mixer "Close"
Ⓒ Power supply, 230 V/50 Hz
Ⓓ Junction box, on site

Switching hysteresis, burner

Permanent switching hysteresis

Code "04:0"



Heat demand-dependent switching hysteresis

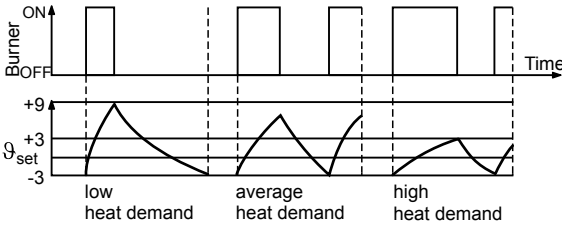
The heat demand-dependent switching hysteresis takes the boiler load into account.

Boiler water temperature control (cont.)

The switching hysteresis, i.e the burner runtime varies subject to actual heat demand.

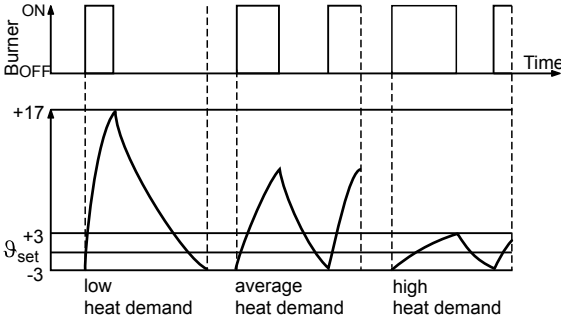
ERB50 function

Code "04:1"
Subject to heat demand, values between 6 and 12 K result.



ERB80 function

Code "04:2"
Subject to heat demand, values between 6 and 20 K result.



Control sequence

Boiler goes cold

(set value –2 K)
The burner start signal is set as the set boiler water temperature minus 2 K, and the burner starts its own monitoring program.

The burner start may be delayed by a few minutes subject to the number of auxiliary circuits and the combustion type.

Boiler water temperature control (cont.)

Boiler heats up

The burner stopping point is determined by the shutdown differential (coding address "13" in category 2 **"Boiler"**).

Cylinder temperature control

Brief description

- The cylinder temperature controller functions as a constant temperature controller. This is achieved by starting and stopping the circulation pump for cylinder heating.
  The switching differential is ±2.5 K.
- For heating the DHW cylinder, a set boiler water temperature is defaulted that lies 20 K above the set DHW temperature (change in coding address "60" in category 3 **"DHW"**).
- During cylinder heating, central heating is switched off (optional cylinder priority control).

Functions

Frost protection

The DHW cylinder will be heated to 20 ºC if the DHW temperature falls below 5 ºC.

Auxiliary function for DHW heating

This function is activated by providing a second set DHW temperature via coding address "58" in category 3 **"DHW"** and activating the fourth DHW phase for DHW heating.

Set DHW temperature

The set DHW temperature can be adjusted between 10 and 60 °C.
The set range can be extended up to 95 ºC via coding address "56" in category 3 **"DHW"**.

System with primary store

The above functions also apply in conjunction with primary store systems.

Cylinder temperature control (cont.)

Set the following codes: "4C:1", "4E:2" in category 1 **"General"**, "55:3" in category 3 **"DHW"** (see coding overview).

System with solar DHW heating

A third set DHW temperature can be defaulted via coding address "67" in category 3 **"DHW"**.

Reheating by the boiler will be suppressed above this value. The DHW cylinder is heated exclusively by the solar thermal system.

Control sequence

Coding "55:0" in category 3 "DHW", cylinder heating

The DHW cylinder goes cold (set value −2.5 K; change via coding address "59" in category 3 "**DHW**"):

- The set boiler water temperature is adjusted 20 K higher than the set DHW temperature (adjustable via coding address "60").
- Pump on:
  - Starting the circulation pump for cylinder heating subject to the boiler water temperature (code "61:0"): The circulation pump starts when the boiler water temperature is 7 K higher than the DHW temperature.
  - Immediate start of the circulation pump for cylinder heating (code "61:1").

The DHW cylinder is hot (set value +2.5 K):

- The set boiler water temperature is returned to the selected set value.
- Pump run-on:
  The circulation pump runs on after cylinder heating until one of the following criteria is met:
  - The differential between the boiler water and the DHW temperature is less than 7 K.
  - The weather-compensated set flow temperature has been reached.
  - The set DHW temperature is exceeded by 5 K.
  - The set max. run-on time has been reached (coding address "62").
- Without pump run-on (code "62:0")

Coding "55:1" in category 3 "DHW", adaptive cylinder heating

With adaptive cylinder heating, the speed of the temperature rise during DHW heating is taken into account.

Cylinder temperature control (cont.)

The DHW cylinder goes cold (set value −2.5 K; change via coding address "59"):
- The set boiler water temperature is adjusted 20 K higher than the set DHW temperature (adjustable via coding address "60").
- Pump on:
  - Starting the circulation pump for cylinder heating subject to the boiler water temperature (code "61:0"): The circulation pump starts when the boiler water temperature is 7 K higher than the DHW temperature.
  - Immediate start of the circulation pump for cylinder heating (code "61:1").

The DHW cylinder is hot:
- The control unit checks whether the boiler will still be required to supply heating energy after the cylinder has been heated up or whether residual boiler heat should be transferred to the DHW cylinder.
  Accordingly, the control unit determines the burner and circulation pump stop times to prevent the set DHW temperature being substantially exceeded after the cylinder has been heated up.

Code "55:2" in category 3 "DHW", cylinder temperature control with 2 cylinder temperature sensors

Cylinder temperature sensor 1 enables the circulation pump for cylinder heating and is evaluated for stop conditions during the pump run-on time.
Cylinder temperature sensor 2:

Cylinder heating will start early if a lot of hot water is drawn off. Cylinder heating will terminate early if no hot water is drawn off.

DHW cylinder goes cold:
- Set value −2.5 K, adjustable via coding address "59"
  or
- Actual DHW temperature at sensor 2 < set DHW temperature x factor for start time (adjustment via coding address "69").

The DHW cylinder is hot:
- Set value +2.5 K
  and
- Actual DHW temperature at sensor 2>set DHW temperature x factor for stop time (adjustment via coding address "68").

Coding "55:3" in category 3 "DHW", cylinder temperature control, primary store system

The DHW cylinder goes cold (set value −2.5 K; change via coding address "59"):
- The set boiler water temperature is adjusted 20 K higher than the set DHW temperature (adjustable via coding address "60").
- The primary pump in the primary store system starts.

Cylinder temperature control (cont.)

- The 3-way mixing valve opens and then regulates to the defaulted set DHW temperature.
- The circulation pump for cylinder heating cycles (short term ON and OFF) until the set flow temperature has been reached (set DHW temperature + 5 K). Then it runs constantly.
  If, during heating, the actual value falls below the required set temperature, the circulation pump for cylinder heating will temporarily cycle again.

The DHW cylinder is hot:

- (Cylinder temperature sensor 1:
  Actual value $\geq$ set value
  and
  Cylinder temperature sensor 2:
  Actual value > set value -1.5 K):
- The set boiler water temperature is returned to the weather-compensated set value.
- The circulation pump for cylinder heating stops immediately when the 3-way mixing valve is fully opened
  or
- The circulation pump for cylinder heating stops after expiry of the run-on time that is selected via coding address "62".

Calling up coding level 1

Note
Codes that have not been assigned due to the heating system equipment level or the setting of other codes are not displayed.

1. Press **OK** and ☰ simultaneously for approx. 4 s.
   🔧 flashes on the display.

2. With ▶, select ① for coding level 1 and confirm with **OK**.
   "**I**" flashes on the display for the coding addresses in category 1.

3. Select the category of the required coding address with ▲/▼:
   1: **"General"**
   2: **"Boiler"**
   3: **"DHW"**
   4: **"Solar"**
   6: **"All codes std device"**. In this category, all coding addresses of coding level 1 are displayed in ascending order.
   Confirm selected category with **OK**.

4. Select coding address with ▲/▼.

5. Select value according to the following tables with ▲/▼ and confirm with **OK**.

6. **If you want to reset all codes to their delivered condition:**
   Select **"7"** with ▶ and confirm with **OK**.
   When ⫞ flashes, confirm with **OK**.

   Note
   This also resets codes from coding level 2.

7. Exit coding level 1: Press ⮌.

8. Exit the service level: Press ▶ to select ⑨.

9. Confirm with **OK**.
   "OFF" flashes.

10. Confirm with **OK**.

    Note
    The service level is automatically exited after 30 minutes.

Category 1 "General"

Coding

Coding in the delivered condition		Possible change	
System design			
00:1	One heating circuit without mixer (heating circuit 1), without DHW heating.	00:0	Set automatically if "01:2" or "01:3" has been selected.
		00:2	One heating circuit without mixer A1 (heating circuit 1), with DHW heating (code is adjusted automatically).
Servomotor runtime			
40:...	Runtime, servomotor at plug 52 in conjunction with return temperature raising. Delivered condition specified by the boiler coding card.	40:5 to 40:199	Runtime adjustable from 5 to 199 s.
Boiler circuit pump function			
53:1	System with low loss header: Boiler circuit pump only runs when there is demand if the burner is running (with run-on time).	53:0	System with low loss header: Boiler circuit pump always runs when there is demand.
User no.			
77:1	LON subscriber number.	77:1 to 77:99	LON subscriber number, adjustable from 1 to 99. ***Note*** *Allocate each number **only once**.*
Set flow temperature for external demand			
9b:0	No set minimum boiler water temperature for external demand.	9b:0 to 9b:127	Set value for external demand adjustable from 0 to 127 °C (limited by boiler-specific parameters).

Category 2 "Boiler"

Coding

Coding in the delivered condition		Possible change	
System type			
01:1	Single boiler system.	01:2	Multi boiler system with cascade control via LON (e.g Vitotronic 300-K, type MW1B).
		01:3	Multi boiler system with on-site cascade control (third party control unit) via switching contacts (input 143 and 146) or 0 – 10 V input.
Burner type			
02:1	Two-stage burner.	02:0	Single stage burner.
		02:2	Modulating burner.
Gas/oil operation			
03:0	Gas operation.	03:1	Oil operation (irreversible).
Boiler/burner			
05:...	Modulating burner: Burner curve. Delivered condition specified by the boiler coding card.	05:0	Linear burner curve.
		05:1 to 05:99	Non-linear burner curve (P_T: P_{max})·100 P_T in kW: Partial output at ⅓ of the servomotor runtime P_{max} in kW: Maximum output.
Boiler water temperature maximum limit			
06:87	Set to 87 °C.	06:20 to 06:127	Adjustable from 20 to 127 °C. Observe the temperature controller settings.
Boiler			
07:1	Sequential boiler number in a multi boiler system (in conjunction with coding address "01").	07:2 to 07:4	Consecutive boiler number in multi boiler system.

Category 2 "Boiler" (cont.)

Coding in the delivered condition		Possible change	
Flue gas monitor			
1F:0	With flue gas temperature sensor: Flue gas temperature is not monitored for service display.	1F:1 to 1F:250 °C	When the limit for the flue gas temperature is exceeded, 🔧 is displayed.
Burner service in 100 hours			
21:0	No service interval (hours run) selected.	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10000 h; 1 step ≙ 100 h.
Service interval in months			
23:0	No interval for service.	23:1 to 23:24	Interval adjustable from 1 to 24 months.
Service status			
24:0	No 🔧 display.	24:1	🔧 display (the address is automatically set and must be manually reset after a service has been carried out).

Category 3 "DHW"

Coding

Coding in the delivered condition		Possible change	
Set DHW temperature reheating suppression			
67:40	For solar DHW heating: Set DHW temperature 40 °C. Reheating is suppressed above the selected set temperature (DHW heating by the boiler only if solar energy is not sufficient).	67:0 to 67:95	Set DHW temperature adjustable from 0 to 95 °C (limited by boiler-specific parameters).

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Category 4 "Solar"

Only in conjunction with solar control module, type SM1.

Coding

Coding in the delivered condition		Possible change	
Speed control solar circuit pump			
02:0	Solar circuit pump (multi stage) without speed control by solar control module SM1.	02:1	Solar circuit pump (multi stage) is speed-controlled with wave pack control.
		02:2	Solar circuit pump is speed-controlled with PWM control.
Cylinder maximum temperature			
08:60	The solar circuit pump stops when the actual DHW temperature reaches the maximum cylinder temperature (60 °C).	08:10 to 08:90	The maximum cylinder temperature is adjustable from 10 to 90 °C.
Stagnation time reduction			
0A:5	To protect system components and heat transfer medium: the speed of the solar circuit pump is reduced if the actual DHW temperature is 5 K below the maximum cylinder temperature.	0A:0	Stagnation time reduction is disabled.
		0A:1 to 0A:40	Value for stagnation time reduction is adjustable from 1 to 40 K.
Flow rate solar circuit			
0F:70	The solar circuit flow rate at maximum pump speed is 7 l/min.	0F:1 to 0F:255	Flow rate adjustable from 0.1 to 25.5 l/min; 1 step ≙ 0.1 l/min.

Category 4 "Solar" (cont.)

Coding in the delivered condition		Possible change	
Extended solar control functions			
20:0	No extended control functions enabled.	20:1	Additional function for DHW heating.
		20:2	Differential temperature control 2.
		20:3	Differential temperature control 2 and auxiliary function.
		20:4	Differential temperature control 2 for central heating backup.
		20:5	Thermostat function.
		20:6	Thermostat function and auxiliary function.
		20:7	Solar heating via external heat exchanger without additional temperature sensor.
		20:8	Solar heating via external heat exchanger with additional temperature sensor.
		20:9	Solar heating of two DHW cylinders.

Calling up coding level 2

Note

- *At coding level 2, all codes are accessible, including the codes in coding level 1.*
- *Codes that have not been assigned due to the heating system equipment level or the setting of other codes are not displayed.*

1. Press **OK** and ☰ simultaneously for approx. 4 s.
   🔧 flashes on the display.

2. Press **OK** and ⮌ simultaneously for approx. 4 s.

3. With ▶, select ② for coding level 2 and confirm with **OK**.
   "**I**" flashes on the display for the coding addresses in category 1.

4. Select the category of the required coding address with ▲/▼:
   1: **"General"**
   2: **"Boiler"**
   3: **"DHW"**
   4: **"Solar"**
   6: **"All codes std device"**. In this category, all coding addresses of coding level 2 are displayed in ascending order.
   Confirm selected category with **OK**.

5. Select coding address with ▲/▼.

6. Select value according to the following tables with ▲/▼ and confirm with **OK**.

7. **If you want to reset all codes to their delivered condition:**
   Select **"7"** with ▶ and confirm with **OK**.
   When ⫞ flashes, confirm with **OK**.

   Note
   This also resets codes from coding level 1.

8. Exit coding level 2: Press ⮌.

9. Exit the service level: Press ▶ to select ⑨.

10. Confirm with **OK**.
    "OFF" flashes.

11. Confirm with **OK**.

    Note
    The service level is automatically exited after 30 minutes.

Category 1 "General"

Coding

Coding in the delivered condition		Possible change	
00:1	Heating circuit without mixer A1, without DHW heating.	00:0	Set automatically, if codes "01:2" or "01:3" are selected.
		00:2	Heating circuit without mixer A1, and with DHW heating.
1E:0	With extension EA1 (analogue input 0-10 V): Temperature demand from 0 to 100 °C: 1 V ≙ 10 °C 10 V ≙ 100 °C.	1E:1	Temperature demand from 30 to 120 °C: 1 V ≙ 30 °C 10 V ≙ 120 °C.
20:...	Controller integral time for low loss header in s Delivered condition specified by the boiler coding card. The greater the integral action time, the more accurate but slower the controller.	20:10 to 20:1990	Controller integral time adjustable from 10 to 1990 s; 1 step ≙ 10 s.
22:...	Controller integral time for low loss header in min. Time between burner start and controller start. Delivered condition specified by the boiler coding card.	22:1 to 22:199	Controller integral time adjustable from 1 to 199 min.
30:0	Without plug-in adaptor for external safety equipment 1.	30:1	With plug-in adaptor for external safety equipment 1 (automatic recognition).
31:0	Without plug-in adaptor for external safety equipment 2.	31:1	With plug-in adaptor for external safety equipment 2 (automatic recognition).
32:0	Without extension AM1.	32:1	With extension AM1; automatic recognition.
33:1	Function output A1 at extension AM1:	33:0	DHW circulation pump.
		33:2	Cylinder primary pump.

Category 1 "General" (cont.)

Coding in the delivered condition		Possible change	
	Heating circuit pump, heating circuit without mixer A1 (heating circuit 1).	33:3	Circulation pump for neutralising system or flue gas/water heat exchanger.
34:1	Function output A2 at extension AM1: Heating circuit pump, heating circuit without mixer A1 (heating circuit 1).	34:0	DHW circulation pump.
		34:2	Cylinder primary pump.
		34:3	Circulation pump for neutralising system or flue gas/water heat exchanger.
40:...	Runtime, servomotor at plug 52 in conjunction with return temperature raising. Delivered condition specified by the boiler coding card.	40:5 to 40:199	Runtime adjustable from 5 to 199 s.
4A:0	Sensor 17A not available.	4A:1	Sensor 17A available (e.g. Therm-Control temperature sensor); automatic recognition.
4b:0	Sensor 17B not installed.	4b:1	Sensor 17B installed (e.g. temperature sensor T2) (automatic recognition).
4C:2	Connection at plug 20: Switching contact, Therm-Control.	4C:1	Primary pump, primary store system.
		4C:3	Circulation pump – flue gas/water heat exchanger.
4d:1	Connection at plug 29: Shunt pump.	4d:2	Boiler circuit pump.
		4d:3	Boiler circuit pump with butterfly valve function.
4E:0	Connection at plug 52: Motor for butterfly valve.	4E:1	Motor for 3-way mixing valve for return temperature control.
		4E:2	Motor for 3-way mixing valve, primary store system.
4F:5	Run-on time shunt or boiler circuit pump 5 min.	4F:0	No pump run-on.
		4F:1 to 4F:60	Run-on time adjustable from 1 to 60 min.

Category 1 "General" (cont.)

Coding in the delivered condition		Possible change	
52:0	Without flow temperature sensor for low loss header.	52:1	With flow temperature sensor for low loss header; automatic recognition.
53:1	System with low loss header: Boiler circuit pump only runs when there is demand if the burner is running (with run-on time).	53:0	System with low loss header: Boiler circuit pump always runs when there is demand.
54:0	Without solar thermal system.	54:1	With Vitosolic 100; automatic recognition.
		54:2	With Vitosolic 200; automatic recognition.
		54:3	With solar control module, type SM1, without auxiliary function; automatic recognition.
		54:4	With solar control module, type SM1, with auxiliary function, e.g. central heating backup (automatic recognition).
5b:0	Without extension EA1.	5b:1	With extension EA1; automatic recognition.
5C:0	Function output [157] at extension EA1: central fault message.	5C:1	Feed pump.
		5C:2	Never adjust.
		5C:3	Never adjust.
		5C:4	Never adjust.
		5C:5	Never adjust.
5d:0	Function input DE1 at extension EA1: Not assigned.	5d:1	Not assigned.
		5d:2	External demand with set minimum boiler water temperature. Set value selected in coding address "9b".
		5d:3	External blocking.
		5d:4	External blocking with fault message input.
		5d:5	Fault message input.
		5d:6	Not assigned.

Category 1 "General" (cont.)

Coding in the delivered condition		Possible change	
5E:0	Function input DE2 at extension EA1: Not assigned.	5E:1	Not assigned.
		5E:2	External demand with set minimum boiler water temperature. Set value selected in coding address "9b".
		5E:3	External blocking.
		5E:4	External blocking with fault message input.
		5E:5	Fault message input.
		5E:6	Not assigned.
5F:0	Function input DE3 at extension EA1: Not assigned.	5F:1	Not assigned.
		5F:2	External demand with set minimum boiler water temperature. Set value selected in coding address "9b".
		5F:3	External blocking.
		5F:4	External blocking with fault message input.
		5F:5	Fault message input.
		5F:6	Not assigned.
6C:0	Run-on time for circulation pump, neutralising system at output A1 at extension AM1: None.	6C:1 to 6C:255	Run-on time adjustable from 1 to 255 s.
6d:0	Run-on time for circulation pump, neutralising system at output A2 at extension AM1: None.	6d:1 to 6d:255	Run-on time adjustable from 1 to 255 s.
76:0	Without LON communication module.	76:1	With LON communication module; automatic recognition.
77:1	LON subscriber number.	77:1 to 77:99	LON subscriber number, adjustable from 1 to 99.

Category 1 "General" (cont.)

Coding in the delivered condition		Possible change	
			Note *Allocate each number **only once**.*
78:1	LON communication enabled.	78:0	LON communication disabled.
79:0	Control unit is not fault manager.	79:1	Control unit is fault manager.
80:6	A fault message is issued if a fault occurs for at least 30 s.	80:0	Immediate fault message.
		80:2 to 80:199	The minimum fault duration until a fault message is issued is adjustable from 10 to 995 s; 1 step ≙ 5 s.
88:0	Temperature displayed in °C (Celsius).	88:1	Temperature displayed in °F (Fahrenheit).
8A:175	Do not adjust.		
8b:0	Do not adjust.		
93:0	Fault messages during emissions test function/ service display do not affect central fault messages.	93:1	Fault messages during emissions test function/ service display affect central fault messages.
94:0	System with low loss header: Primary circuit pump and cylinder primary pump always run when there is demand.	94:1	Primary circuit pump only runs when there is demand if the burner is running (with run-on time).
		94:2	Cylinder primary pump only runs when there is demand if the burner is running (with run-on time).
95:0	Without Vitocom 100 communication interface.	95:1	With Vitocom 100 communication interface; automatic recognition.
98:1	Viessmann system number (in conjunction with monitoring several systems via Vitocom 300).	98:1 to 98:5	System number adjustable from 1 to 5.

Category 1 "General" (cont.)

Coding in the delivered condition		Possible change	
9b:0	No set minimum boiler water temperature for external demand.	9b:0 to 9b:127	Set value for external demand adjustable from 0 to 127 °C (limited by boiler-specific parameters).
9C:20	Monitoring LON subscribers: If there is no response from a subscriber, values defaulted by the control unit are used 20 min later, and a fault message is issued.	9C:0	No monitoring.
		9C:5 to 9C:60	Time adjustable from 5 to 60 min.
9d:0	Do not adjust.		

Category 2 "Boiler"

Coding

Coding in the delivered condition		Possible change	
01:1	Single boiler system.	01:2	Multi boiler system with cascade control via LON (e.g Vitotronic 300-K, type MW1B).
		01:3	Multi boiler system with on-site cascade control (third party control unit) via switching contacts (input 143 and 146) or 0 – 10 V input.
02:1	Two-stage burner.	02:0	Single stage burner.
		02:2	Modulating burner.
03:0	Gas operation.	03:1	Oil operation (irreversible).
		03:2	Set automatically if no boiler coding card or an incorrect boiler coding card is inserted.
04:...	Switching hysteresis, burner:	04:0	Switching hysteresis 4 K (see page 131)

Category 2 "Boiler" (cont.)

Coding in the delivered condition		Possible change	
	Delivered condition specified by the boiler coding card.	04:1	Switching hysteresis, heat demand-dependent (see page 131). ERB50 function (values from 6 to 12 K).
		04:2	ERB80 function (values from 6 to 20 K).
05:...	Modulating burner: Burner curve. Delivered condition specified by the boiler coding card.	05:0	Linear burner curve.
		05:1 to 05:99	Non-linear burner curve. $(P_T: P_{max})\cdot 100$ P_T in kW: Partial output at ⅓ of the servomotor run-time P_{max} in kW: Maximum output.
06:87	Maximum limit of the boiler water temperature set to 87 °C.	06:20 to 06:127	Maximum limit adjustable from 20 to 127 °C. Observe the temperature controller settings.
07:1	Sequential boiler number in a multi boiler system (in conjunction with coding address "01").	07:2 to 07:4	Consecutive boiler number in multi boiler system.
08:...	Maximum burner output in kW. Delivered condition specified by the boiler coding card.	08:0 to 08:199	Maximum output adjustable from 0 to 199 kW.
09:...	Maximum burner output in kW. Delivered condition specified by the boiler coding card.	09:0 to 09:199	Maximum output adjustable from 0 to 19,900 kW; 1 step ≙ 100 kW.
0A:...	Burner base load in kW. Delivered condition specified by the boiler coding card.	0A:0 to 0A:100	Non-linear burner curve $(P_G:P_{max})\cdot 100$ % P_G in kW: Base output P_{max} in kW: Maximum output.

Category 2 "Boiler" (cont.)

Coding in the delivered condition		Possible change	
0C:5	Modulating butterfly valve, independent of the set boiler water temperature.	0C:0	No function.
		0C:1	Constant return temperature control.
		0C:2	Time-controlled butterfly valve.
		0C:3	Butterfly valve switching subject to the boiler water temperature.
		0C:4	Butterfly valve modulating subject to the set boiler water temperature.
0d:2	With Therm-Control, affects the butterfly valve (function disabled with code "0C:1").	0d:0	Without Therm-Control.
		0d:1	With Therm-Control, affects the mixers of downstream heating circuits.
13:...	Shutdown differential in K. The burner is switched off when the set boiler water temperature is exceeded. Delivered condition specified by the boiler coding card.	13:0	Without stop differential.
		13:2 to 13:20	Stop differential adjustable from 2 to 20 K.
14:...	Minimum burner runtime in min. Delivered condition specified by the boiler coding card.	14:0 to 14:15	Minimum runtime adjustable from 0 to 15 min.
15:10	Runtime servomotor modulating burner 10 s.	15:5 to 15:199	Runtime adjustable from 5 to 199 s. For the Vitocrossal, see separate service instructions.
16:...	Burner offset with start optimisation in K (temporary reduction of the set boiler water temperature after burner start).	16:0 to 16:15	Offset adjustable from 0 to 15 K.

Category 2 "Boiler" (cont.)

Coding in the delivered condition		Possible change	
	Delivered condition specified by the boiler coding card.		
1A:...	Start optimisation in min. Delivered condition specified by the boiler coding card.	1A:0 to 1A:60	Duration of start optimisation adjustable from 0 to 60 min.
1b:60	Time from burner ignition before control starts 60 s.	1b:0 to 1b:199	Control delay adjustable from 1 to 199 s.
1C:120	Signal B4 at plug 41 is not available: Compensation of signal delay for hours run meter. Time from burner start signal initiation at T2 in plug 41 to opening of the solenoid valve. At each burner start, 120 s will be taken off the runtime.	1C:1 to 1C:199	Delay adjustable from 1 to 199 s. This time is deducted from the operating time for every burner start. E.g. operating situations in which the burner is shut down via the mechanical temperature controller, but a burner demand is still present (hours run continue to be counted). If required, change coding address "06".
1F:0	With flue gas temperature sensor: Flue gas temperature is not monitored for service display.	1F:1 to 1F:250 °C	When the flue gas temperature limit is exceeded, 🔧 is displayed.
21:0	No service interval (hours run) selected.	21:1 to 21:100	The number of hours run before the burner should be serviced is adjustable from 100 to 10,000 h; One adjusting step ≙ 100 h.
23:0	No interval for service.	23:1 to 23:24	Interval adjustable from 1 to 24 months.

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Category 2 "Boiler" (cont.)

Coding in the delivered condition		Possible change	
24:0	No 🔧 display.	24:1	🔧 display (the address is automatically set and must be manually reset after a service has been carried out).
26:0	Burner fuel consumption (stage 1): No count if "26:0" **and** "27:0" are programmed.	26:1 to 26:99	Input of 0.1 to 9.9; 1 step ≙ 0.1 l/h or gph. ***Note*** *Values of coding addresses "26" and "27" are added together.*
27:0	Burner fuel consumption (stage 1): No count if "26:0" **and** "27:0" are programmed.	27:1 to 27:199	Input of 10 to 1990; 1 step ≙ 10 l/h or gph.
28:0	No burner interval ignition.	28:1 to 28:24	Interval adjustable from 1 to 24 h. Burner is force-started for 30 s respectively.
29:0	Burner fuel consumption (stages 1 and 2): no count if "29:0" **and** "2A:0" are programmed.	29:1 to 29:99	Input of 0.1 to 9.9; 1 step ≙ 0.1 l/h or gph. ***Note*** *Values of coding addresses "29" and "27" are added together.*
2A:0	Burner fuel consumption (stages 1 and 2); no count if "29:0" **and** "2A:0" are programmed.	2A:1 to 2A:199	Input of 10 to 1990; 1 step ≙ 10 l/h or gph.
2b:5	Maximum preheating time of the butterfly valve 5 min.	2b:0	No preheating time.
		2b:1 to 2b:60	Preheating adjustable from 1 to 60 min.
2C:5	Maximum run-on time of the butterfly valve 5 min.	2C:0	No run-on time.
		2C:1 to	Run-on time adjustable from 1 to 60 min.

Category 2 "Boiler" (cont.)

Coding in the delivered condition		Possible change	
		2C:60	
2d:0	Shunt pump control function only "ON" if the boiler is enabled.	2d:1	Shunt pump control function permanently "ON".

Category 3 "DHW"

Coding

Coding in the delivered condition		Possible change	
55:0	Cylinder heating, hysteresis ± 2.5 K.	55:1	Adaptive cylinder heating enabled (see page 134).
		55:2	Cylinder temperature control with 2 cylinder temperature sensors (see page 135).
		55:3	Cylinder temperature control, primary store system (see page 135).
56:0	Set DHW temperature adjustable from 10 to 60 °C.	56:1	Set DHW temperature adjustable from 10 to 95 °C. ***Note*** *Observe the max. permissible DHW temperature. Reset the temperature controller "⏱".*
58:0	Without auxiliary function for DHW heating.	58:1 to 58:95	Input of a second set DHW temperature, adjustable from 1 to 95 °C (observe coding address "56").
59:0	Cylinder heating: Start point: Set value −2.5 K Shutdown point: Set value +2.5 K	59:1 to 59:10	Start point adjustable from 1 to 10 K below the set value.
5A:0	For DHW heating:	5A:1	For DHW heating:

Category 3 "DHW" (cont.)

Coding in the delivered condition		Possible change	
	The set boiler water temperature is determined by the highest system flow temperature demand.		The set boiler water temperature is determined by the DHW cylinder flow temperature demand.
60:20	During DHW heating, the boiler water temperature is up to 20 K higher than the set DHW temperature.	60:5 to 60:50	The differential between the boiler water temperature and the set DHW temperature is adjustable from 10 to 50 K.
61:1	The circulation pump for cylinder heating is started immediately.	61:0	The circulation pump for cylinder heating is started depending on the boiler water temperature.
62:10	Circulation pump with a run-on time after cylinder heating of up to 10 min.	62:0	Circulation pump without run-on.
		62:1 to 62:15	Run-on time adjustable from 1 to 15 min.
63:0	Without auxiliary function for DHW heating.	63:1	Auxiliary function: 1 x daily.
		63:2 to 63:14	Every 2 days to every 14 days.
		63:15	2 x daily.
67:40	For solar DHW heating: Set DHW temperature 40 °C. Reheating is suppressed above the selected set temperature (DHW heating by the boiler only if solar energy is not sufficient).	67:0 to 67:95	Set DHW temperature adjustable from 0 to 95 °C (limited by boiler-specific parameters).
68:8	With 2 cylinder temperature sensors (code "55:2"): Cylinder heating stop point at set value x 0.8.	68:2 to 68:10	Factor adjustable from 0.2 to 1; 1 step ≙ 0.1.
69:7	With 2 cylinder temperature sensors (code "55:2"):	69:1 to 69:9	Factor adjustable from 0.1 to 0.9; 1 step ≙ 0.1.

Category 3 "DHW" (cont.)

Coding in the delivered condition		Possible change	
	Cylinder heating start point at set value x 0.7.		
6A:75	Runtime, servomotor, mixing valve, heat exchanger set, Vitotrans 222, 80 and 120 kW: 75 s.	6A:10 to 6A:255	For heat exchanger set Vitotrans 222, 240 kW: set 113 s. Runtime adjustable from 10 to 255 s.

Category 4 "Solar"

Only in conjunction with solar control module, type SM1.

Coding

Coding in the delivered condition		Possible change	
00:8	The solar circuit pump starts when the collector temperature exceeds the actual DHW temperature by 8 K.	00:2 to 00:30	The differential between the actual DHW temperature and the start point for the solar circuit pump is adjustable from 2 to 30 K.
01:4	The solar circuit pump stops when the differential between the collector temperature and the actual DHW temperature is less than 4 K.	01:1 to 01:29	The differential between the actual DHW temperature and the stop point of the solar circuit pump is adjustable from 1 to 29 K.
02:0	Solar circuit pump (multi stage) without speed control by solar control module SM1.	02:1	Solar circuit pump (multi stage) is speed-controlled with wave pack control.
		02:2	Solar circuit pump is speed-controlled with PWM control.
03:10	The temperature differential between the collector temperature and actual DHW temperature is regulated to 10 K.	03:5 to 03:20	The differential temperature control between the collector temperature and actual DHW temperature is adjustable from 5 to 20 K.

Category 4 "Solar" (cont.)

Coding in the delivered condition		Possible change	
04:4	Controller amplification of the speed control 4 %/K.	04:1 to 04:10	Controller amplification adjustable from 1 to 10 %/K.
05:10	Minimum speed of the solar circuit pump 10 % of the maximum speed.	05:2 to 05:100	Minimum speed of the solar circuit pump is adjustable from 2 to 100 %.
06:75	Maximum speed of the solar circuit pump 75 % of the maximum possible speed.	06:1 to 06:100	Maximum speed of the solar circuit pump is adjustable from 1 to 100 %.
07:0	Interval function of the solar circuit pump switched off.	07:1	Interval function of the solar circuit pump switched on. To capture the collector temperature more accurately, the solar circuit pump starts for short cycles.
08:60	The solar circuit pump stops when the actual DHW temperature reaches the maximum cylinder temperature (60 °C).	08:10 to 08:90	The maximum cylinder temperature is adjustable from 10 to 90 °C.
09:130	The solar circuit pump stops if the collector temperature reaches 130 °C (maximum collector temperature to protect the system components).	09:20 to 09:200	The temperature is adjustable from 20 to 200 °C.
0A:5	To protect system components and heat transfer medium: The solar circuit pump speed is reduced when the actual cylinder temperature is 5 K below the maximum cylinder temperature.	0A:0	Stagnation time reduction is disabled.
		0A:1 to 0A:40	Value for stagnation time reduction is adjustable from 1 to 40 K.

Category 4 "Solar" (cont.)

Coding in the delivered condition		Possible change	
0b:0	Frost protection function for solar circuit switched off.	0b:1	Frost protection function for solar circuit switched on (not required with Viessmann heat transfer medium).
0C:1	Delta T monitoring switched on. No flow rate captured in the solar circuit, or flow rate too low.	0C:0	Delta T monitoring switched off.
0d:1	Night circulation monitoring switched on. Unintentional flow rate is captured in the solar circuit (e.g. at night).	0d:0	Night circulation monitoring switched off.
0E:1	Calculation of solar yield with Viessmann heat transfer medium.	0E:2	Calculation of solar yield with water as heat transfer medium (never adjust, as operation is only possible with Viessmann heat transfer medium).
		0E:0	Calculation of solar yield switched off.
0F:70	The solar circuit flow rate at maximum pump speed is 7 l/min.	0F:1 to 0F:255	Flow rate adjustable from 0.1 to 25.5 l/min. 1 step ≙ 0.1 l/min.
10:0	Target temperature control switched off (see coding address "11").	10:1	Target temperature control switched on.
11:50	Set solar DHW temperature 50 °C.	11:10 to 11:90	The set solar DHW temperature is adjustable from 10 to 90 °C.

Category 4 "Solar" (cont.)

Coding in the delivered condition		Possible change	
	■ Target temperature control switched on (code "10:1"): Temperature at which the solar heated water in the DHW cylinder is to be stratified. ■ Extended control functions set to heat two DHW cylinders (code "20:8"): The second DHW cylinder is heated when one DHW cylinder reaches its set DHW temperature.		
12:10	Minimum collector temperature 10 °C. The solar circuit pump will only start when the set minimum collector temperature is exceeded.	12:0	Minimum collector temperature function switched off.
		12:1 to 12:90	The minimum collector temperature is adjustable from 1 to 90 °C.
20:0	No extended control functions enabled.	20:1	Additional function for DHW heating.
		20:2	Differential temperature control 2.
		20:3	Differential temperature control 2 and auxiliary function.
		20:4	Differential temperature control 2 for central heating backup.
		20:5	Thermostat function.
		20:6	Thermostat function and auxiliary function.
		20:7	Solar heating via external heat exchanger without additional temperature sensor.

Category 4 "Solar" (cont.)

Coding in the delivered condition		Possible change	
		20:8	Solar heating via external heat exchanger with additional temperature sensor.
		20:9	Solar heating of two DHW cylinders.
22:8	Start temperature differential for central heating backup: 8 K. Switching output [22] is switched on when the temperature at sensor [7] exceeds the temperature at sensor [10] by the selected value.	22:2 to 22:30	Start temperature differential for central heating backup is adjustable from 2 to 30 K.
23:4	Stop temperature differential for central heating backup: 4 K. Switching output [22] is switched off when the temperature at sensor [7] falls below the stop point. The stop point is the sum of the temperature at sensor [10] and the value selected for the stop temperature differential.	23:2 to 23:30	Stop temperature differential for central heating backup is adjustable from 1 to 29 K.
24:40	Start temperature for thermostat function 40 °C. Start temperature for thermostat function ≤ stop temperature for thermostat function: Thermostat function, e.g. for reheating. Switching output [22] is switched on when the temperature at sensor [7] falls below the start temperature for the thermostat function.	24:0 to 24:100	Start temperature for thermostat function is adjustable from 0 to 100 K.

Category 4 "Solar" (cont.)

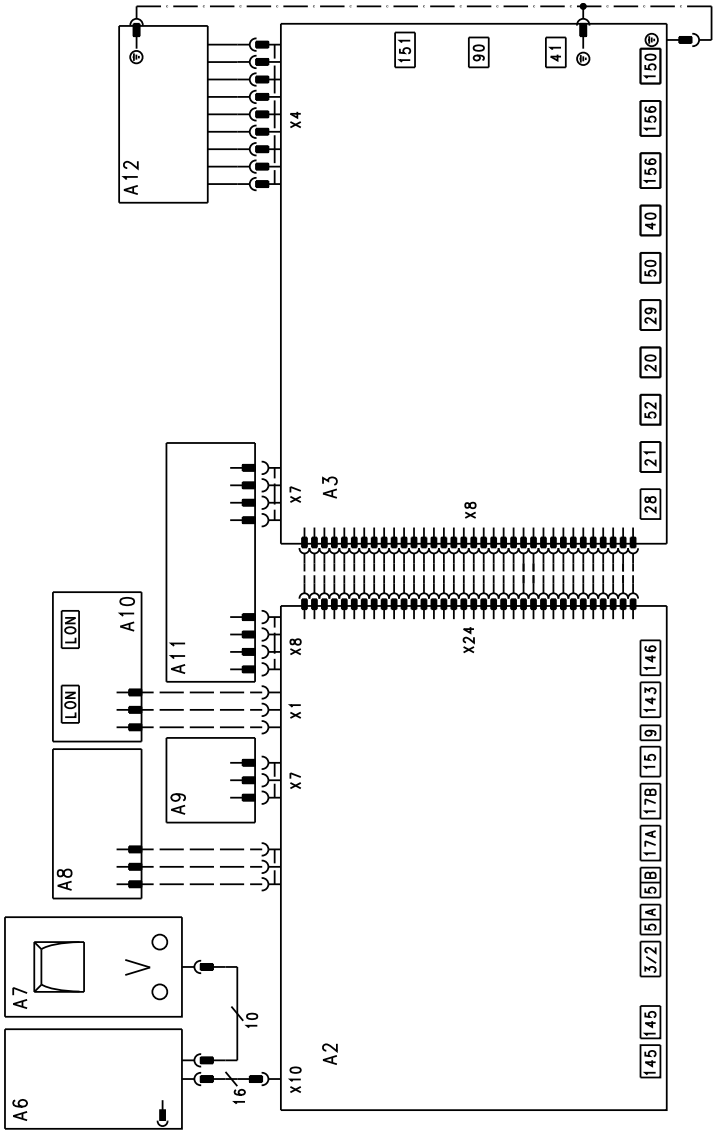
Coding in the delivered condition		Possible change	
	Start temperature for thermostat function > stop temperature for thermostat function: Thermostat function, e.g. for utilising excess heat. Switching output [22] is switched on when the temperature at sensor [7] exceeds the start temperature for the thermostat function.		
25:50	Stop temperature for thermostat function 50 °C. Start temperature for thermostat function ≤ stop temperature for thermostat function: Thermostat function e.g. for reheating. Switching output [22] is switched off when the temperature at sensor [7] exceeds the start temperature for the thermostat function. Start temperature for thermostat function > stop temperature for thermostat function: Thermostat function e.g. for utilising excess heat. Switching output [22] is switched off when the temperature at sensor [7] falls below the start temperature for the thermostat function.	25:0 to 25:100	Start temperature for thermostat function is adjustable from 0 to 100 K.
26:1	Priority for DHW cylinder 1 – with alternate heating.	26:0	Priority for DHW cylinder 1 – without alternate heating.

Category 4 "Solar" (cont.)

Coding in the delivered condition		Possible change	
	Only when setting code "20:8".	26:2	Priority for DHW cylinder 2 – without alternate heating.
		26:3	Priority for DHW cylinder 2 – with alternate heating.
		26:4	Alternate heating without priority for one of the DHW cylinders.
27:15	Alternate heating time 15 min. The DHW cylinder without priority is heated at most for the duration of the set alternate heating time if the DHW cylinder with priority is heated up.	27:5 to 27:60	The alternate heating time is adjustable from 5 to 60 min.
28:3	Alternate pause time 3 min. After the selected alternate heating time for the DHW cylinder without priority has expired, the rise in collector temperature is captured during the alternate pause time.	28:1 to 28:60	The alternate pause duration is adjustable from 1 to 60 min.

Connection and wiring diagram

Overview



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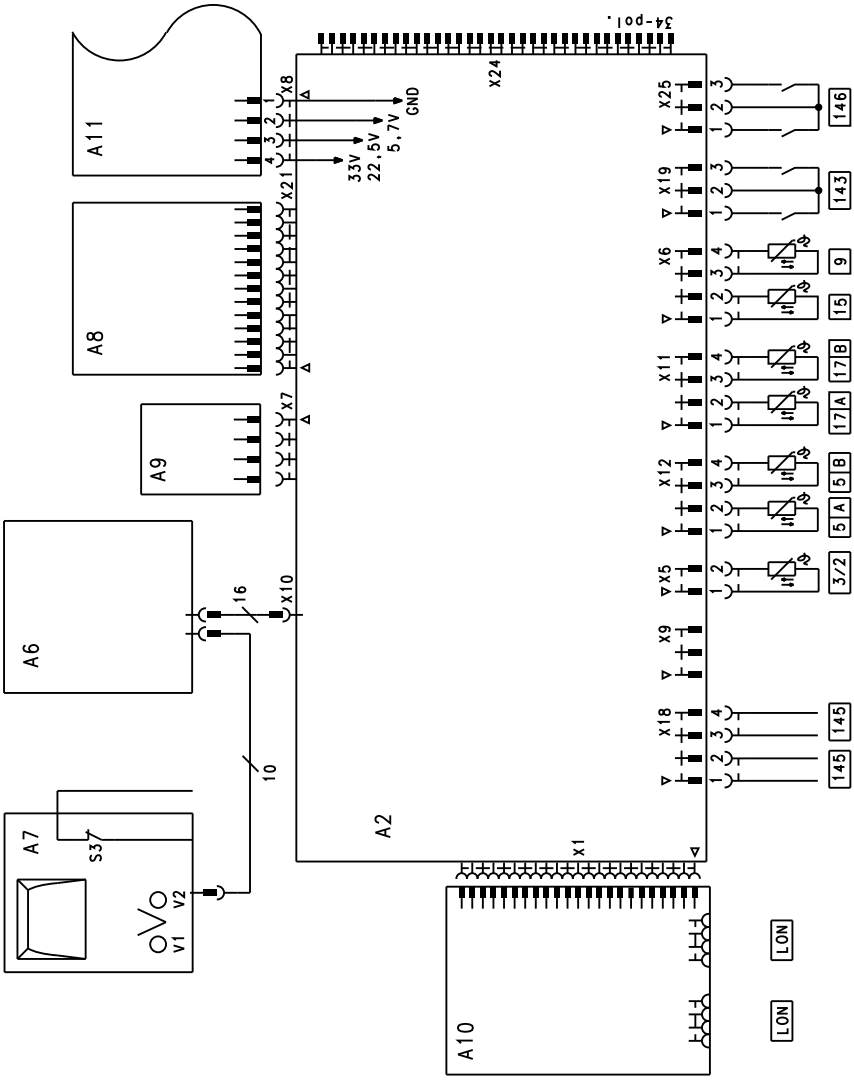
Connection and wiring diagram (cont.)

A2 Main PCB low voltage
A3 Main PCB 230 V~
A6 Programming unit
A7 Optolink PCB/emissions test switch
A8 PCB
A9 Boiler coding card
A10 LON communication module (accessory)
A11 Power supply unit PCB
A12 ON/OFF switch
X Electrical interfaces

Connection and wiring diagram (cont.)

Main PCB low voltage



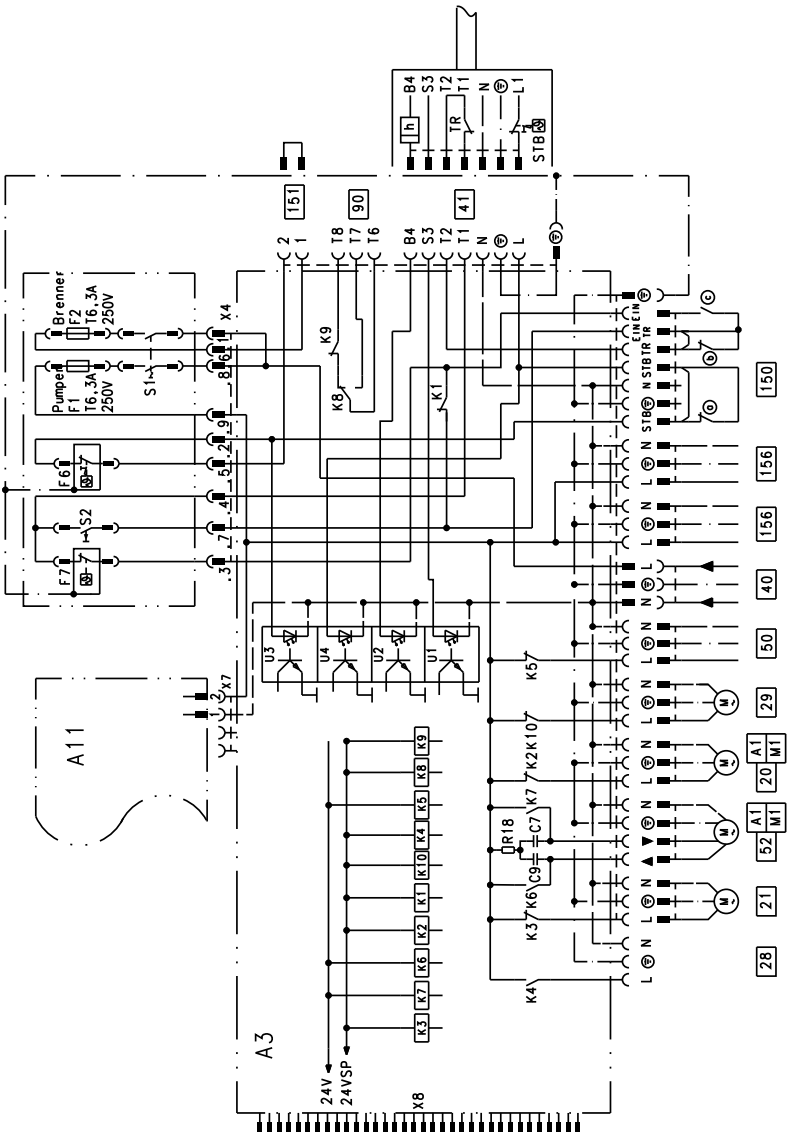
3 Boiler water temperature sensor
5A Cylinder temperature sensor
5B Cylinder temperature sensor 2 for primary store system
9 Flow temperature sensor

Connection and wiring diagram (cont.)

15	Flue gas temperature sensor
17A	Therm-Control temperature sensor or Return temperature sensor T1
17B	Return temperature sensor T2 or Temperature sensor primary store system
143	External hook-up
145	KM BUS subscriber
146	External hook-up
LON	Cable for data exchange between control units (accessories)
S3	Emissions test switch
V1	Fault indicator (red)
V2	ON indicator (green)
X	Electrical interfaces

Connection and wiring diagram (cont.)

Main PCB 230 V~



Connection and wiring diagram (cont.)

20	Primary pump, primary store system or Circulation pump – flue gas/ water heat exchanger or Switching output
21	Circulation pump for cylinder heating (accessory)
28	No function
29	Shunt pump or boiler circuit pump (on site)
40	Power supply, 230 V/50 Hz
41	Oil/gas burners
50	Central fault message
52	Butterfly valve or Mixer motor, return temperature raising facility or Motor for 3-way mixing valve, primary store system
90	Burner stage 2/modulating
150	External connections (remove jumper when connecting) ⓐ External safety equipment ⓑ External blocking
151	Safety chain (potential-free)
156	Power supply for accessories
F1, F2	Fuse
F6	High limit safety cut-out 110 °C (100 °C)
F7	Temperature controller 95 °C (100 °C)
K1-K10	Relay
S1	ON/OFF switch
S2	TEST key
X	Electrical interfaces

Boiler coding card

Boiler	Boiler coding card		
	Service menu display "Diagnosis" category"General"	Identification	Spare part no.
Vitocrossal 300, type CT3	1040	7435 870	7837 015
Vitocrossal 200, type CM2	1041	7435 871	7837 016
Vitocrossal 300, type CR3, CR3B			
Vitocrossal 300, type CM3	1042	7435 872	7837 017
Vitocrossal 200, type CT2			
Vitomax 300-LT	1070	7435 876	7837 021
Vitoplex 200, type SX2A	1001	7435 865	7837 010
Vitoplex 300, type TX3A	1010	7435 866	7837 011
Vitoradial 300-T	1010	7435 866	7837 011
Vitorond 200, type VD2, VD2A	1020	7435 867	7837 012

Sensors

Boiler, cylinder, flow (Therm-Control sensor) and return temperature sensor

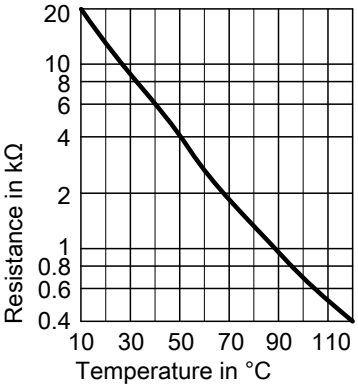
Checking sensors

Note

The flow temperature sensor can be used as a contact or immersion temperature sensor.

Sensors (cont.)

Viessmann NTC 10 kΩ (blue identification)



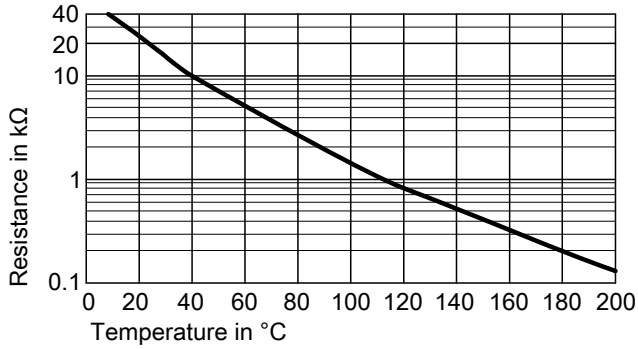
1. Pull corresponding plug.
2. Check the sensor resistance and compare it with the curve.
3. In the case of severe deviation, check the installation and replace the sensor if required.

Flue gas temperature sensor, part no. 7452 531

A service message appears when a set limit has been reached (see coding address "1F" in category 2 **"Boiler"**).

Checking the flue gas temperature sensor

Viessmann NTC 20 kΩ (orange identification)



1. Disconnect plug [15].

Sensors (cont.)

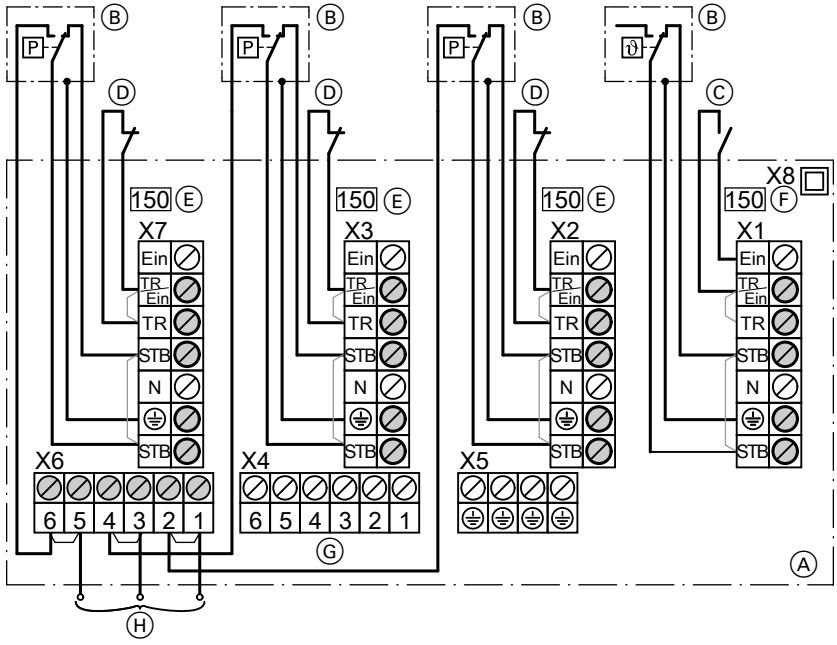
2. Check the sensor resistance and compare it with the curve.
3. In the case of severe deviation, check the installation and replace the sensor if required.

Plug-in adaptor for ext. safety equipment, part no. 7164 404

Connecting one plug-in adaptor

The plug-in adaptor is automatically recognised by the control unit as a KM BUS subscriber.
The following external safety equipment can be connected to EN 12828:

- Low water indicator
- Maximum pressure limiter
- Minimum pressure limiter
- Additional high limit safety cut-out
- Controlled external burner shutdown
- External burner demand (stage 1)



Ⓐ Connection area

Plug-in adaptor for ext. safety equipment, part… (cont.)

Ⓑ External safety equipment
- X1 Additional high limit safety cut-out
  or
  Temperature limiter
- X2 Minimum or maximum pressure limiter
- X3 Maximum pressure limiter
- X7 Low water indicator

Ⓒ External burner start
Ⓓ Controlled external shutdown
Ⓔ Plug 150
Ⓕ Plug 150 of the control unit
Ⓖ Connection for cable with plug 150 to the control unit
Ⓗ To the control panel or to the message facility

Observe the **order** of the connections shown in the diagram.
Remove the jumper in plug 150 when connecting the external safety equipment.

Note
A plug 150 ***must*** *be inserted into every socket "X1", "X2", "X3" and "X7".*

Connecting two plug-in adaptors

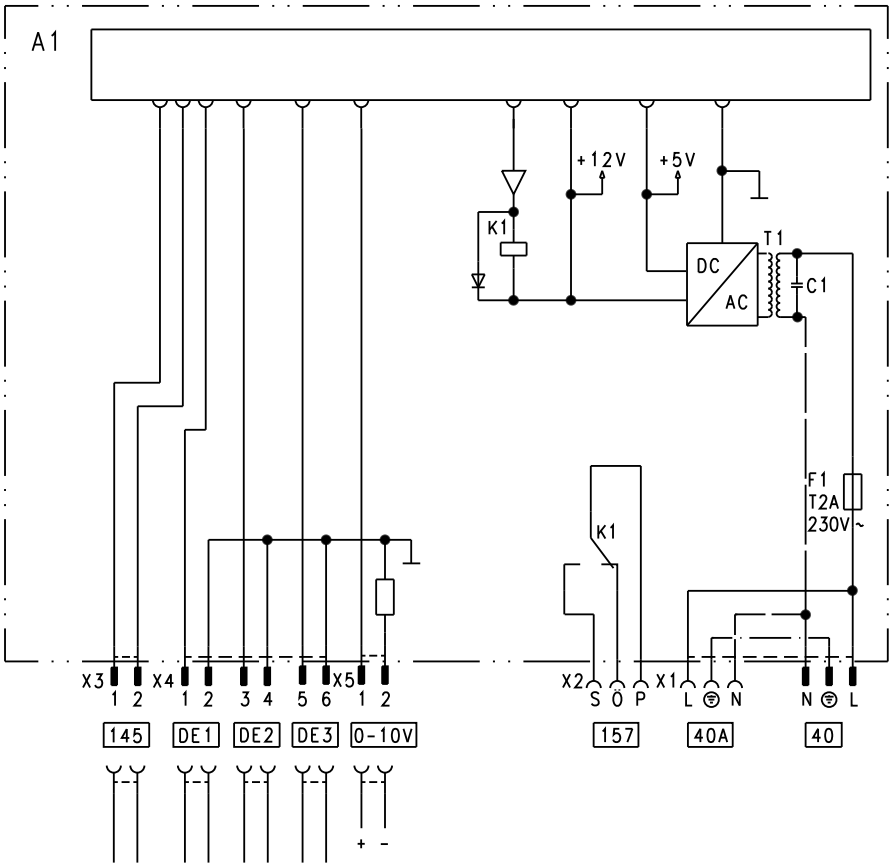
Separate installation instructions

Make the connections in plug-in adaptor **1** as described in the previous chapter.
In plug-in adaptor **2**, the connections can be made in any order.

Rotary selector setting

The rotary selector is located in the upper part of the plug-in adaptor.
Delivered condition: Setting 1
Plug-in adaptor 1: Setting 1
Plug-in adaptor 2: Setting 2

Extension EA1



DE1	Digital input 1
DE2	Digital input 2
DE3	Digital input 3
0 - 10 V	0 - 10 V input
40	Power supply
40 A	Power supply for additional accessories
157	Central fault message (potential-free)
145	KM BUS

Digital inputs DE1 to DE3

Functions:

- External blocking
- External blocking with fault message input
- External demand with minimum boiler water temperature
- Fault message input

Extension EA1 (cont.)

When connecting external contacts, observe the requirements of safety category II, i.e. 8.0 mm air-gap and creep path or maintain a 2.0 mm insulation thickness against 'live' parts.

Input function assignment

Select the input functions via the codes on the boiler control unit:
- DE1: Coding address "5d"
- DE2: Coding address "5E"
- DE3: Coding address "5F"

Set flow temperature for external demand

- The set flow temperature can be selected with code 9b.

Analogue input 0 - 10 V

The 0 - 10 V hook-up provides an additional set boiler water temperature:
0 - 1 V is seen as "no default set boiler water temperature".

Coding address "1E" in category 1 **"General"**.
- "1E:0" ≙ temperature demand adjustable in the range from 0 to 100°C
  1 V ≙ 10 °C set value modification
  10 V ≙ 100 °C set value modification
- "1E:1" ≙ temperature demand adjustable in the range from 30 to 120°C
  1 V ≙ 30 °C set value modification
  10 V ≙ 120 °C set value modification

Ensure DC separation between the negative pole and the earth conductor of the on-site voltage source.

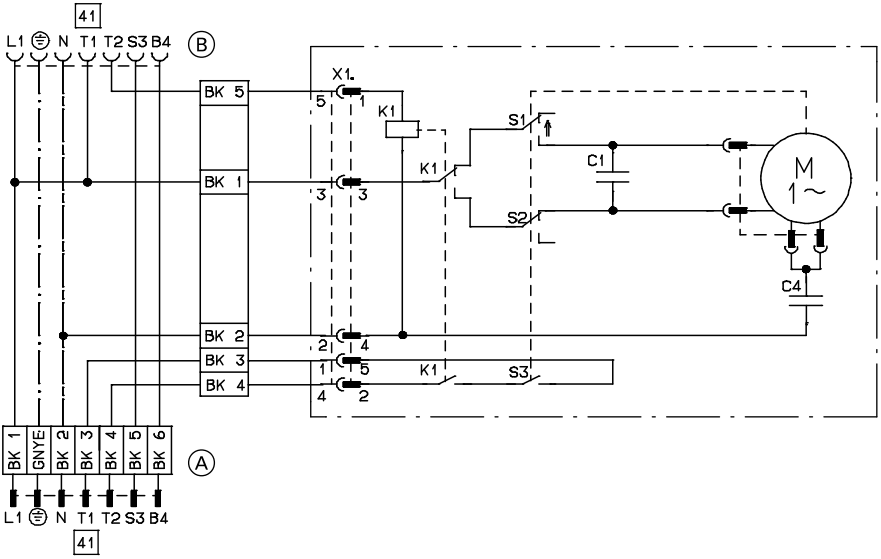
Output 157

Connection of a central fault message facility.

Function assignment

Select the function of output 157 via coding address "5C".

Secondary air device Vitoair, part no. 7338 725, 7339 703

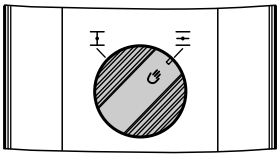


Ⓐ To the burner

Ⓑ To the control unit

Colour coding to DIN IEC 60757
BK black
GN/YE green/yellow

Function check



Press the rotary selector at the motor and simultaneously turn it to its central position.

- Enable burner from the control unit ⇒ The rotary selector should turn towards "⇆".
- Burner OFF ⇒ The rotary selector should turn towards "↕".

Secondary air device Vitoair, part no. 7338… (cont.)

Emergency mode

Press the rotary selector on the motor and turn clockwise to the limit, i.e. beyond position "⇥".

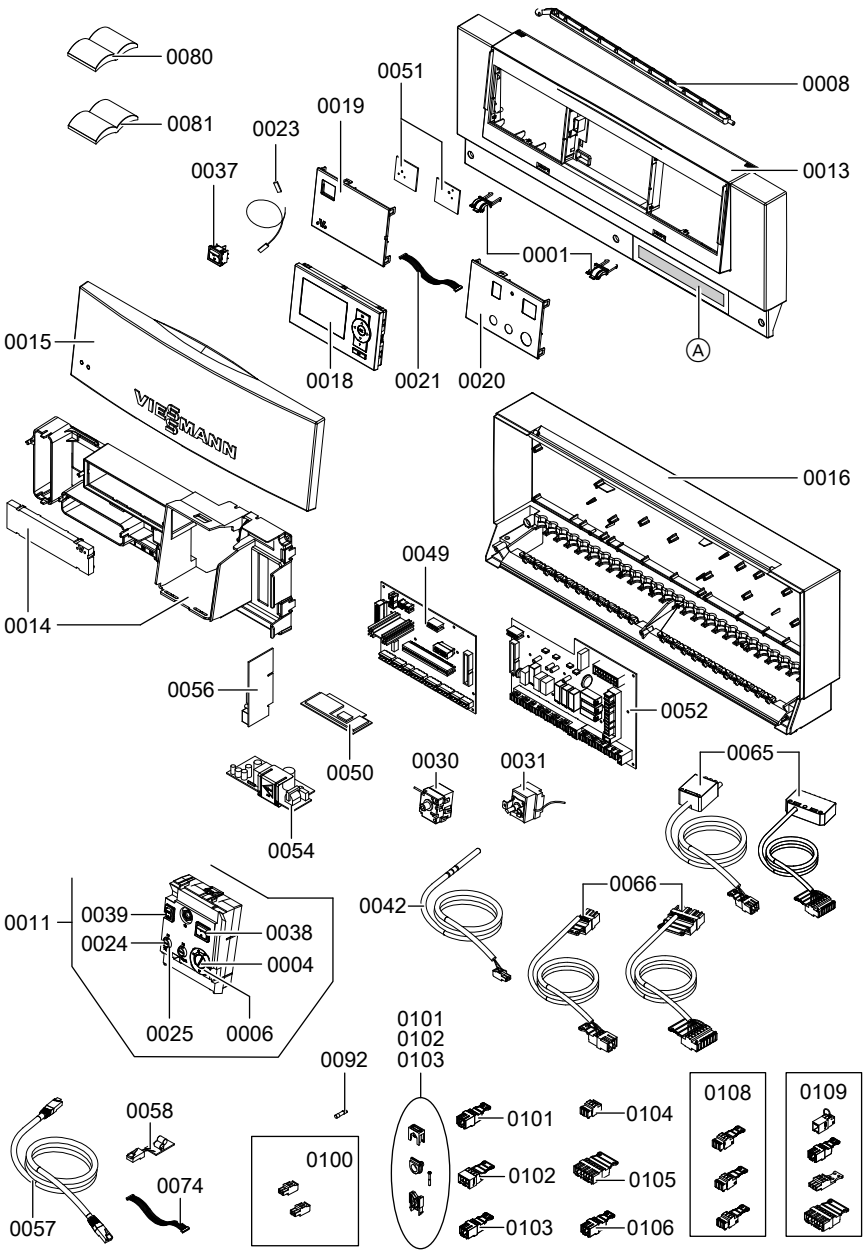
Parts list

When ordering spare parts
Quote the part and serial no. (see type plate Ⓐ) and the item no. of the required part (as per this parts list).
Standard parts are available from your local supplier.

Parts

0001 Hinges
0004 Temperature controller rotary selector
0006 Temperature controller stop dial
0008 Supporting stay
0011 Safety valve with wiring
0013 Casing front with frame (see pos. 001)
0014 PCB cover
0015 Front flap
0016 Casing, rear panel
0018 Programming unit
0019 Fascia left
0020 Fascia right
0021 Ribbon cable, 10-PIN
0023 Connecting cable, emissions test switch
0024 Fuse holder cap for control fuse
0025 Fuse holder for control fuse
0030 High limit safety cut-out
0031 Temperature controller
0037 Emissions test switch, single-pole
0038 ON/OFF switch, 2-pole
0039 "TEST" key, single-pole
0042 Temperature sensor (boiler water temperature sensor or cylinder temperature sensor)
0049 Main PCB low voltage
0050 PCB
0051 Optolink PCB and emissions test switch
0052 Main PCB 230 V~
0054 Power supply unit PCB
0056 LON communication module
0057 LON cable
0058 LON terminator
0065 Burner connecting cable with plug [41] and burner connecting cable with plug [90]
0066 Burner connecting cable with plug [41] and burner connecting cable with plug [90] for Vitocrossal
0074 Connection line
0080 Installation and service instructions
0081 Operating instructions
0092 Fuse, 6.3 A (slow), 250 V~
0100 Plug for LV (7 pce)
0101 Plug for pumps (3 pce)
0102 Plug [52] (3 pce)
0103 Plug [156] (3 pce)
0104 Power supply plug [40] (3 pce)
0105 Plug [150]
0106 Plug [50] (3 pce)
0108 Plug [143], [145], [146]
0109 Burner plugs [41], [90], [151] and [191]
Ⓐ Type plate

Parts list (cont.)



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Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 x 6 A~
Power consumption	10 W
Safety category	I
IP rating	IP 20 D to EN 60529, ensure through design/ installation
Function	Type 1 B to EN 60730-1
Permiss. ambient temperature	
■ During operation	0 to +40 °C Installation in living spaces or boiler rooms (standard ambient conditions)
■ During storage and transport	–20 to +65 °C

Rated relay output breaking capacity at 230 V~

20	Primary pump, primary store system or Circulation pump – flue gas/water heat exchanger or Switching output	4 (2) A~[*1]
21	Circulation pump for cylinder heating	4 (2) A~[*1]
29	Shunt pump or boiler circuit pump	4 (2) A~[*1]
50	Central fault message	4 (2) A~[*1]
52	Butterfly valve Mixer motor, return temperature raising facility or Motor, 3-way mixing valve, primary store system	0.2 (0.1) A~[*1]
41	Burner	6 (3) A~
90	Burner (two-stage)	1 (0.5) A~
90	Burner (modulating)	0.2 (0.1) A~

*[*1] Total max. 6 A~*

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Applicability

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